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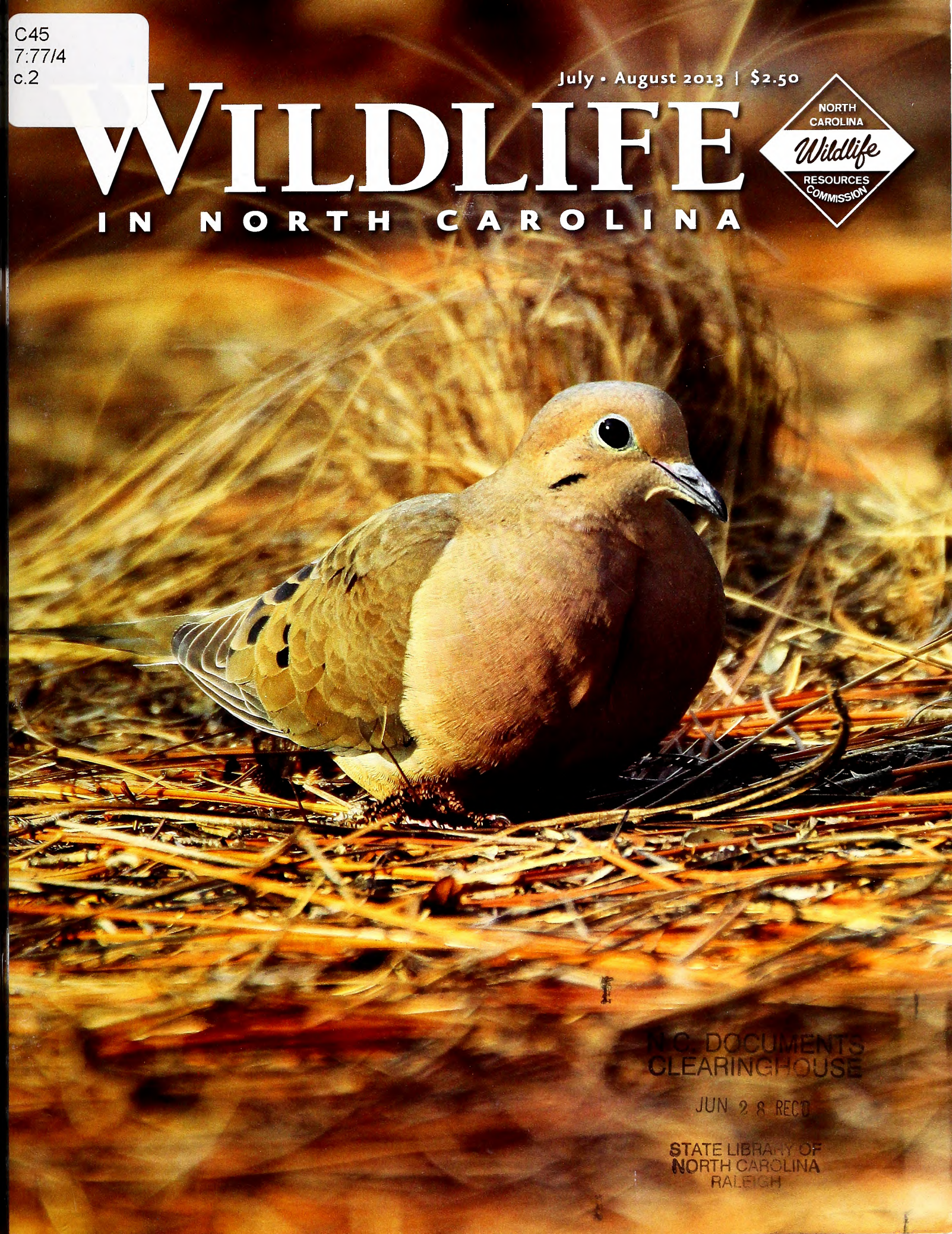
WILDLIFE IN NORTH CAROLINA

NORTH CAROLINA Wildlife RESOURCES COMMISSION



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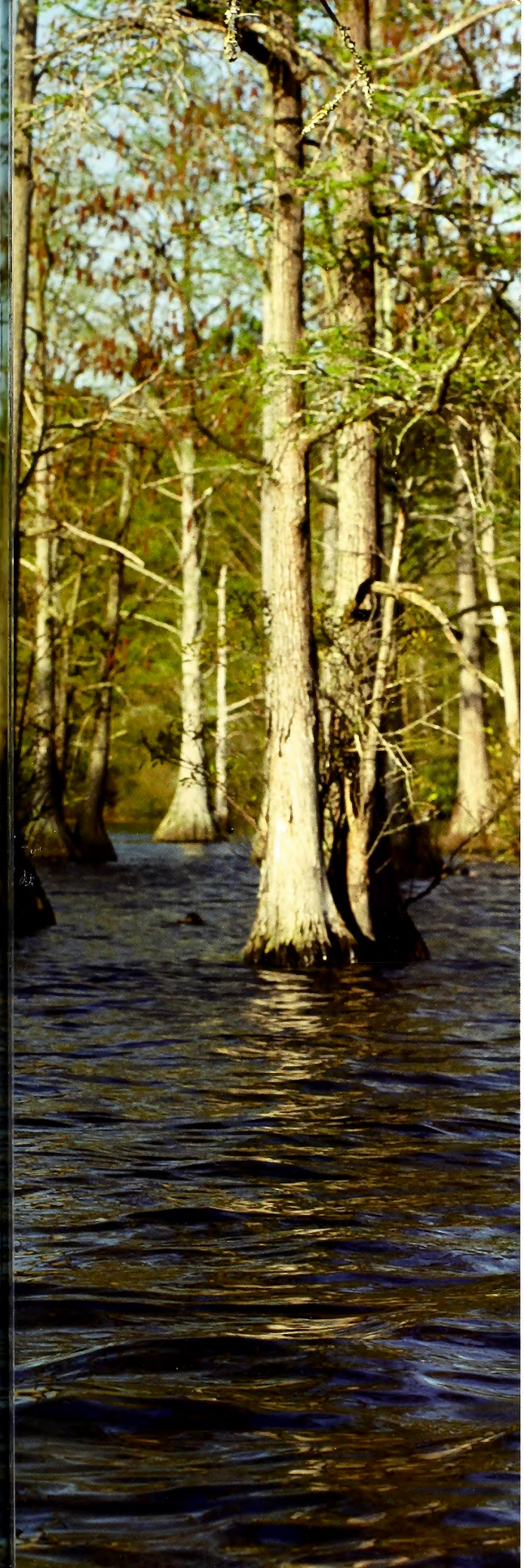
Majestic cypress trees are numerous at Rhodes Pond. Before the commission acquired the property, it was a beautiful setting with limited access.
PHOTOGRAPH BY MELISSA McGAW/NCWRC.



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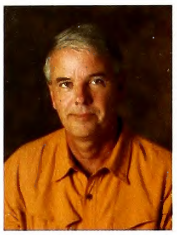
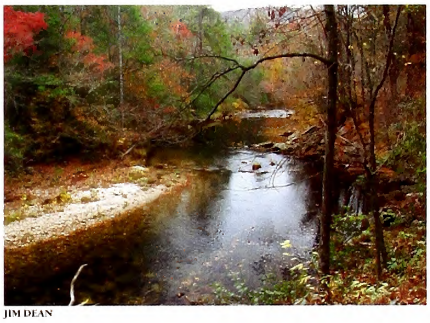
Cover: The ground-feeding mourning dove (*Zenaida macroura*) is America's most popular game bird. PHOTOGRAPH BY TODD PUSSER.

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.



EDITOR'S NOTE

That the old men who gathered in the restaurant most mornings would take such an interest in my story of having fished a certain distant creek was unexpected. Although I guess they weren't so much interested in my story as in the fact that I had fished a place they had loved years ago before the weight of seven or eight decades, and in cases even nine, had eroded the will to fish, but not the desire.



JIM DEAN

Each of them was excited and as full of questions as a group of teenage girls discussing their dates. "Did you go up the Staircase? Was there ice hanging from the rocks along the road? Did you go on up past the High Bridge? Did you see the little white church?" They talked of Grand Ole Opry stars that once fished there, and a local carpenter so talented that if you showed him furniture pictured in the Sears & Roebuck catalog, he could fashion it for you.

They weren't interested in what I caught, which was just as well, considering that I left my chest pack filled with all my flies beside the back door that morning. I had put on waders and strung up my fly rod at the trunk of my car, then spent a futile five minutes searching for flies, and another equally futile 10 minutes hoping to find one fly, just one, lying forgotten on the floorboard or back seat or snagged in the trunk upholstery. Usually I could find two or three, but not this day.

So I walked and sat and studied the clear, green water, listening to the creek and watching the occasional trout, as Seamus Heaney writes, as it "slips like butter down the throat of the river." Perhaps I was half-hoping to run into a kind stranger who might spot me a fly, but it was a cold, low day and not a soul was fishing. It was exhilarating.

Yet the brightest moment of that day occurred on the drive up, when at last I had pressed deep enough into the mountains that my cell phone became useless. I tossed it on the seat beside me and in an instant was almost giddy, so happy that I began laughing aloud. No one knew where I was, and for the first time in years, I had no one to report to, no one who would be awaiting my return. I was alone, with only the mountains and water for company. It seemed like all I could ever want.

Jim Wilson

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A BEAR HUNT
at Oakland

Understanding Hunting and Harvesting

I recently received my May/June edition of *Wildlife* and I was surprised to see a letter written by Walter Bennett from Chapel Hill regarding several recent articles published by the magazine. Apparently this reader was not pleased with articles and pictures associated with bear hunting and harvesting. Nor was he pleased with people accessing our beaches with vehicles. I applaud the staff for publishing such a critical analysis of their work despite the fact that Walter completely missed some points that were made in the articles as well as the pictures that were included with each story.

As responsible hunters and stewards of the resources of our state, we are tasked with ensuring that current hunters and future hunters understand the whole picture of what hunting and harvesting entails. Hunting isn't just shooting an animal, resting the gun close to the carcass, and posing for a picture to post on your chosen social media site. Fishing isn't just throwing a line in a stream and pulling out that prize trout for another photo. Harvesting the resources of this land involves hard work which includes the proper use and disposal of that animal. Hunters need to know that only 10 percent of the hunt happens before the shot is fired while the other 90 percent occurs after. To show any pictures that appear less graphic or less offensive would not accurately depict what actually occurs. If these articles or pictures keep people that aren't committed to completely fulfilling their obligations as a hunter, then please post more of them. None of us want people on our lands wasting our resources any more than Walter. I would hardly refer to responsible hunting and fishing as a bloodsport as Walter calls it. It is simply called hunting.

In regards to Mr. Bennett's comments about driving "fat-tired SUV's" on the beaches and its impact on endangered species and the environment, I would suggest that he come and spend some time with those of us who actually go out on these beaches with our families to fish. My family has been going to the Oregon Inlet area for nearly 20 years. We pick up trash as it floats past us in the water, or as we pass where it has washed up on the beach. We are the ones who call NPS officials when people act inappropriately or when we see wildlife in need. We drive safely, as we always have, even before the ridiculous restrictions which have damaged our state's coastal economy. To imply that all or most of the hunters and fishermen who use our beaches are harming this resource is not only inaccurate but inappropriate. There is so much more I could say about this topic alone but that is obviously another article in itself. I can conclude this portion by merely stating that we don't outlaw cars and alcohol because a few individuals make poor choices to drink and drive so why would we close our beaches to vehicles because of a handful of problem people?

Again, thanks to the magazine staff for publishing Mr. Bennett's letter. Hopefully he and others will understand that there are sometimes even more than just two sides to an issue.

Todd Lontz
Concord

Walter Bennett's letter in the May issue entitled "Too Much Harvesting" struck a nerve with me, and I'm sure with many other "longtime" *Wildlife in North Carolina* subscribers. He makes statements about recognizing the need for hunting to maintain healthy game populations and even talks about once being a bird hunter and is still an avid fisherman.

But then he proceeds to chastise articles in the magazine pertaining to hunting and fishing calling them "blood-sports." I take great offense to such unjustified labeling and find Mr. Bennett's attitude toward other people's enjoyment of nature in a different way repulsive. Plus, in the ending statement to insinuate we will soon be celebrating open harvest of seals on our beaches is ludicrous.

Mr. Bennett should first realize that this magazine has from its inception been tied to hunting and fishing in North Carolina, and with the continued support of hunters and fishermen always will be. There certainly are other purely "nature only" magazines available that might best fit Mr. Bennett's interests if he cannot deal with this.

I am confident that the majority of subscribers to *Wildlife in North Carolina* are sincere fans of the way it is published today, and all that it represents.

David Howell
Wilson

Salute to Bluegills on the Fly

Thanks to Jim Dean for once again highlighting the simple beauty of catching bluegills on a fly. Reading "Black and Bluegill" (May/June 2013) motivated me to pull out the tying vice and create a few variations of this effective panfish fly. These flies are extremely attractive to bream and are most fun to use when they are fished as a dropper underneath a standard popper. And fishing them as droppers beneath poppers frequently leads to two-at-a-time catches.

Like Dean, I too have noticed that panfish favor the darker body patterns like the ant pattern and even traditional trout nymph patterns such as the Pheasant Tail. These simple but effective patterns are also great ways to introduce children to fly-fishing and fly-tying.

Philip Swicegood
Shelby

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Rhodes Pond provides a picturesque place for anglers and paddlers. Lora Kempka is shown weaving her way through a stand of cypress trees.

RHODES POND

REDUX: Making an old pond a better place

Written by Mike Zlotnicki & Photographed by Melissa McGaw

When Lora Kempka of Dunn first visited Rhodes Pond in Godwin as a child, Phil Niekro was throwing knuckleballs to Biff Pocoroba in Atlanta. (That would be mid-'70s for non-Braves fans.) The pond was a bucolic setting—thousands of cypress trees and much aquatic vegetation—but tough to fish without a boat.

She returned in the '90s to fish and again in 2004 to take nature pictures. In 2012 she and her husband, Robert Baker, came back to do some fishing in their newly acquired kayaks.

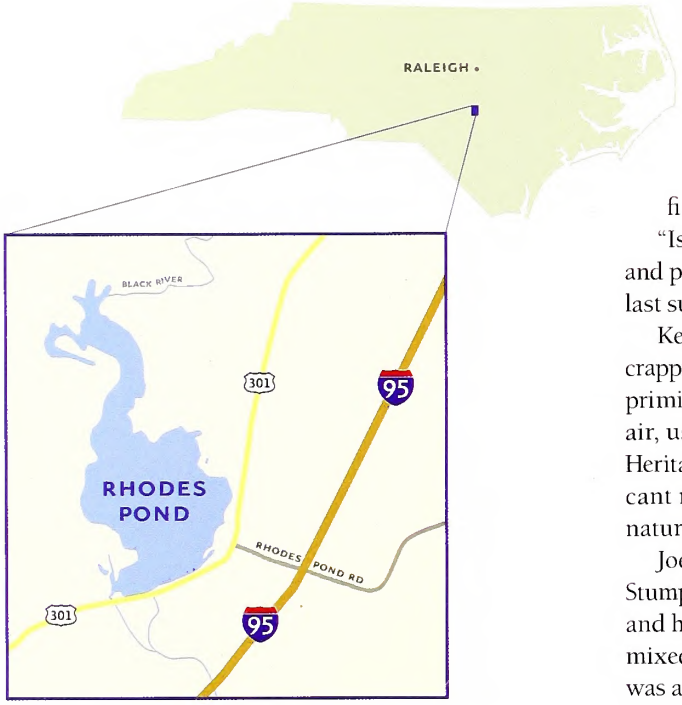
"We put in the kayaks and paddled across the pond and saw people fishing on a big pier," she said as she walked along the east bank. "A man and boy were fishing off a little pier, and we looked at each other and said 'what's going on?'"

What was "going on" was a new T-shaped fishing pier with handicapped access and another small fishing platform at the end of an old dike. In fact, Kempka and Baker had launched their kayaks next to a new floating dock and concrete boat ramp. It was the culmination of work by the N.C. Wildlife Resources Commission after acquiring the property in 2005.

The 460-acre pond has a long history. It was originally impounded in the 1700s by damming the Black River (the smaller of the two Black Rivers in the state) with an earthen dam and pegged-log spillway to operate a gristmill and a sawmill. It has also been the site of a cotton gin, turpentine distillery, gas station, post office, tourist court and restaurant, according to the N.C. Department of Commerce, Division of Tourism, Film and Sports Development. According to the Fayetteville Area Convention and Visitors Bureau website, it was known as Smith's Mill pond in the 1800s as part of the John Smith Plantation. From the 1920s until 1964 it was known as Holland's Lake. In 1964 the Honeycutt family purchased the pond and dubbed it Rhodes Pond Fish Camp, offering access for a small fee.

"It's a great place to bring your family and go fishing or have a picnic."

A floating T-shaped fishing pier has added to angler access at Rhodes Pond. Terry Green, right, of Dunn wets a line along with another angler. Opposite page: Joe Stump fishes for bass with his fishing partner, Private. Stump said the pond reminds him of his "home" water in Florida.



The N.C. Department of Transportation (NCDOT) purchased the property in 2004 for $375,000. The money came from the N.C. Ecosystem Enhancement Program, part of the N.C. Department of Environment and Natural Resources, which offers voluntary in-lieu-fee mitigation programs to the public and private sectors to satisfy compensatory-mitigation requirements in state and federal laws and regulations.

The dam was old and failing, threatening to turn Rhodes Pond into Rhodes Swamp. The dam construction was contracted out and the commission built the T-shaped fishing pier, a concrete boat ramp and floating dock and a smaller fishing platform. The commission also offers permit waterfowl hunts on a limited basis during the early and late seasons, as well as small game permit hunts on the game land.

The commission renovated a building for office space and fenced off a plot of ground as a storage depot for construction equipment, which enabled the commission to manage the property and house equipment also used in the eastern part of the state. The projects totaled about $553,000 and the funding came from hunting and fishing license sales, vessel registrations and the Sportfish Restoration Fund (Dingell-Johnson Act). The NCDOT also contributed $150,000 for dam repairs.

Erik Christofferson, division chief of engineering and lands management at the commission, thinks it was money well spent.

"When Director Gordon Myers and I visited the property and saw the number of people enjoying this wonderful natural resource, we knew we needed to preserve and improve it," he said. "DOT transferred ownership to us, and we went to work immediately by enhancing accessibility. We built handicapped-accessible facilities such as a new boat ramp and a fishing pier. It is a huge improvement, and we have received many favorable comments from the public." Following Kempka around the pond, it wasn't hard to share in her appreciation of the scenic setting. Ducks flew overhead and herons awaited fish in the shallows.

"Isn't this awesome?" Kempka said she stepped on the fishing pier and pointed to the handicapped access points. "We came three times last summer and there were eight or 10 people fishing each time."

Kempka and her husband fish from their kayaks for panfish, bass, crappie and catfish, but the lake also hosts chain pickerel and bowfin, a primitive fish that can survive in oxygen-depleted water by gulping air, using its swim bladder as a primitive lung. The N.C. Natural Heritage Program has designated Rhodes Pond as a regionally significant natural area due to the presence of "rare species, exemplary natural communities or important animal assemblages."

Joe Stump prefers the assemblage of bass. One sunny day last spring Stump, a U.S. Army staff sergeant, launched his Tracker aluminum boat and headed out for an afternoon of bass fishing accompanied by his mixed breed canine partner, Private. Stump, a native of Sebring, Fla., was asked if it reminded him of home.

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"That's exactly why I fish it," he said. "I'm a backwoods country structure fisherman and Rhodes reminds me of Florida."

Stump said his father had bought the boat after he wired the money home while Stump was deployed in the Middle East. Rhodes has become a destination for him.

"It's got a good boat ramp," he said. "Some of the shallow boat ramps you nearly have to back your truck in the water. It's a great place to bring your family and go fishing or have a picnic."

Sherwood Lucas has a unique history with Rhodes Pond. As a child, he lived a couple of miles from the property and visited frequently. "When I was 13 or 14 I used to ride my bike every Saturday afternoon. I hotfooted over to Rhodes Pond," he said. "They had a bait and tackle shop there and you could rent a boat for a buck a day."

Later, Lucas would enlist in the military and use his G.I. Bill to go to N.C. State, where he studied civil engineering and did his post graduate work in soil mechanics and foundations. He returned to the area and fished the pond frequently. A favorite memory involved largemouth bass and a revolutionary new lure.

"Plastic worms had just come on the scene in the early '60s and people weren't familiar with them," he said. "I bought a pack of them, black worms. We'd throw them up against a tree and let them dribble down. Wham, they'd hit it. One day we had 22 bass when we got back to the shore. We released most of them and kept three or four. People asked us what we caught them on and we said 'yellow Shysters' [an inline spinner]. I believe there wasn't a yellow Shyster anywhere in Dunn by evening."

Fast forward to March of 2011, and the angler becomes renovator as Lucas' firm subcontracted the dam repairs.

"I was tickled to death to work on the dam," said Lucas. "I bid it tight. I wanted the job. The dam was more damaged than we had previously thought. I would venture to say that if we hadn't fixed it the dam wouldn't be there right now."

Gas motors are not allowed on the pond, and with I-95 a quarter mile to the east, that helps keep the setting serene. Other than the piers and boat ramp there are no other public facilities at Rhodes. It serves anglers, paddlers, birders and boaters. And once on the water, it looks like it did 250 years ago. See for yourself.

Mike Zlotnicki is the associate editor of Wildlife in North Carolina. *He may be reached at 919-707-0175 or at mike.zlotnicki@ncwildlife.org.*

SUMMERTIME SOLUTION

SIMPLE, EFFECTIVE TROLLING TACTICS FOR WHEN SUMMER STARTS AND THE FISH GO DEEP

written by
JEREMY GARDY
photographed by
MELISSA MCGAW

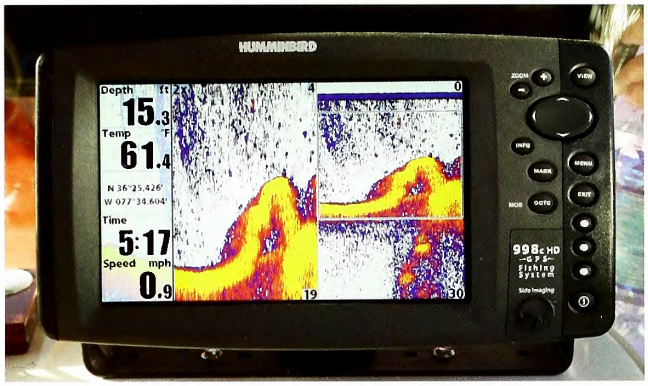
Trolling has been around as long as man has been able to propel a boat and drag a line through the water. Some anglers have never trolled, while others, that's all they do. Years ago when I worked at a local downtown hardware store we stocked a huge selection of Storm Hot 'N Tots and lead-core line for the fishermen that we referred to as walleye trollers. We always could tell which colors were working by seeing which ones were selling.

My dad loved to troll. And many times on hot summer afternoons, when other tactics weren't working we would turn to trolling, and many times, it would save the day. Dad always used a white Bomber, and he would give me an old Arbogast Mud Bug. It seemed like he knew when we were about to get a strike. He would say, "OK, after we move past this point, be ready," and that was always my cue to focus on that rod tip. And more times than not, one of us would get a strike.

One particular afternoon, a nice smallmouth hit Dad's bomber. I hadn't caught a fish that day, and this made several he had caught, being a typical 8-year-old boy, I wasn't too happy. So I slowly began to reel the lure while watching Dad's smallmouth jump as he played it. I soon felt something heavy on the line, and it was starting to pull back, but didn't jump. Dad netted his fish, and asked me if I had something. I replied, "I think so." So he stepped to the back of the boat while holding the net. Immediately a huge walleye appeared, I could see the big glassy eyes and prominent teeth. The fish began to thrash the surface; I just pulled him to the back of the boat so Dad could net him. He lifted the fish into the boat and the lure fell out of his mouth. The fish measured 28½ inches. I was shivering!

When you hear of anglers talk about trolling, you automatically think of boats in open water, using specialized equipment and elaborate electronics, trolling depths deeper than 30 feet or so. These methods work, but you can consistently catch quality fish trolling depths significantly shallower than that from late spring well into fall. Trolling offers the angler the ability to cover a lot of water in a short amount of time, thus exposing the lure to a lot of fish. If you do locate fish at a certain depth, you can catch good numbers.

About the time when spring turns into summer, various species such as smallmouth bass, walleye, white perch, white bass, striped bass, crappie and some largemouth bass move out of the shallows into deeper water, and spend most of the year there. But they don't go very deep, and can be reached by trolling. At a time when conventional shallow fishing methods aren't producing very well, trolling offers a nice option.



IF YOU'RE NOT SEEING MANY FISH ON THE DEPTH FINDER, DON'T LET IT DETER YOU. KEEP IN MIND THAT YOU'RE ONLY LOOKING AT A 3- OR 4-FOOT WIDE WINDOW DOWN THERE, AND YOU DON'T KNOW WHAT'S TO THE RIGHT OR LEFT OF IT.

Start by looking at a topographical map of the lake you frequently fish. Look for long coves that may have a series of points. What you're trying to do is have a series of opportunities to expose your lure to as many fish as possible on a given troll. Any kind of structures —rock piles, brush piles or stumps— on these points are an added bonus. This structure will be found by trial and error and by using the depth finder. As soon as your lures have cleared a point, start looking at the next one. Also, look to see if there's a series of points on the other side of the cove going in, if you're not getting any hits where you're at, it might be worth a try. Sometimes, if there isn't much boat traffic, you might be able to make a huge circle.

Often a cove will have a feeder stream that comes in at the back; this will carve out a channel that meanders through the cove. Fish will stay in this channel, or will be close to it most of the year. Sometimes this channel will come close to the point you're trolling which can make for a dynamite place. Sometimes fish will move out a channel up on a point to feed, this may happen early in the morning or later in the day.

Other places to think about trolling are on the main channel of the lake. There fish have access to deep water and can move up to feed. Sometimes I just parallel the bank and watch the depth finder, attempting to stay in the depth that's working. Here, you'll cross points and structure, and you may cover some ledges as well. Sometimes fish may not be in the coves, especially later in the summer, and may be in the main channel where the water is a couple of degrees cooler.

The next part of the equation is depth, and it starts with a decent depth finder. You don't have to invest in some incredibly expensive model, the one I have is a basic Lowrance that cost less than $200. Most new bass boats come with one, and sometimes two, already installed. A lot of used boats already have them as well. Although you can find fish with a depth finder, I use it primarily for watching the bottom, searching for bottom irregularities, such as channels, humps, ledges, drop offs, ridges or ditches. But more importantly, I try to stay at a depth that's been working. Also, if I see that I'm approaching a point that may move up shallow which may cause my lure to get hung up, I can at least try to steer the boat and avoid it. And if I'm in deeper water than I would like, I can move shallower.

If you're not seeing many fish on the depth finder, don't let it deter you. Keep in mind that you're only looking at a 3- or 4-foot wide window down there, and you don't know what's to the right or left of it.

Once you've established where you're going to troll, the last part of the equation is speed. You don't want to go too fast, and you want the lure to achieve maximum depth with best action. I don't press the gas at all when trolling; therefore speed is pretty much a constant. My motor is a Yamaha 115 two-stroke, and when engaged without pushing the gas pedal, runs about 750 rpm. Ideal trolling speed is somewhere between 1 to 2 miles per hour. Sometimes, serious trollers will have a small 10-horsepower motor mounted beside their big motor and use it specifically for trolling.

The idea is to troll your lure so that it's within several feet of the bottom. If I'm trolling water that's 20 feet deep, I want the lure to

run around 17 or 18. It's OK if you bump the bottom occasionally, this will provoke strikes. I don't like to be constantly digging the bottom because of the risk of getting snagged. So it helps to know just how deep your lures are going. And this you'll learn with some experience. Sometimes, some species of fish are suspended. And I've actually had my lures to run below them. This is a good time to have a fishing partner with you, with him using a different lure at a different depth. Based on what starts happening that day, you can adjust accordingly.

Something that can alter depth is line size. I learned this the hard way one day when trolling with a friend, Jeff Canipe. Jeff was using 10-pound test line, while I was using 17. We were using the same exact lures, but he caught a nice walleye pushing 20 inches every time we crossed a particular point. Needless to say, I was left scratching my head when we left that day. After going home and pondering this, his line size must have allowed the lure to get a foot or two deeper and probably caused better action. Since that time I downsized my line to 10 pound, and could tell a huge increase in strikes. When using the smaller line size, you have to keep a constant check on the line. Any abrasion weakens the line significantly, so it's worth a retie. Also, I keep the drag loose on the reel; this acts as a cushion if I have a hard strike or get snagged.

As for how much line to let out, I want the lure to trail about 60 to 70 yards behind the boat. Here is where you need to know how much line your reel holds. If the reel holds 150 yards of 10-pound line, just eyeball the spool, when it looks like a third has peeled off, engage the reel. When changing line at the beginning of the fishing season, you can strip off roughly 60 yards of old line, and retie fresh line of a different color with a blood knot; this way you know exactly how much line is out. I don't let the knot out into the water; therefore it stays within several turns of the handle on the reel. Or you can buy reels that have a line counter on them that are specifically made for trolling. They start around $50.

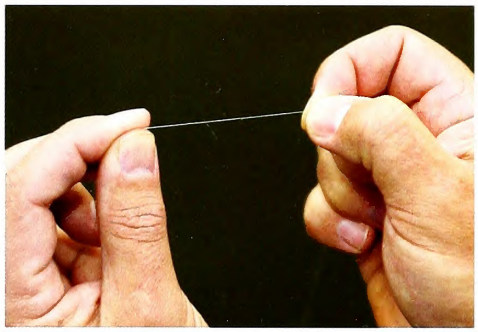
As for lures, just like those old Bombers and Mud Bugs that Dad and I used, any crankbait with a big lip will work. With the crankbait craze in today's bass fishing world, you actually have a lot of choices. I mostly use sizes from ¼ ounce and up. In early summer, I start with the ¼-ounce size. This size doesn't go as deep, but the fish aren't that deep yet. You can actually troll deeper than the fish, but usually they won't go down to take a lure. They're much more inclined to come up to strike. Some crankbaits are made specifically for trolling at various depths; this takes some of the guesswork out of wondering how deep the lure goes. As summer wears on, I start using the larger sizes.

Having the large lip helps the lure keep from snagging on any underwater debris. It causes the lure to bounce off whatever it hits which can trigger a strike. If your lure does get snagged, which sooner or later it will, a valuable tool to have is some sort of lure retriever. This one device will save you lots of money in the long run. I usually retrieve three out of four lures that get snagged. The one I have clicks on my line and slides down to the lure and knocks it free. As for colors, I primarily stay with shad and crayfish colors. The crayfish in the local lake I fish, have more of an olive color, therefore the lures I pick have the same coloration.

Thus far I've talked about trolling with monofilament line and crankbaits. But many serious trollers use lead core line with a 10-foot monofilament leader. Lead core line is braided Dacron wrapped around a small lead core, and allows lures to achieve deeper depths, sometimes 40 feet or so. Here you can use any size of lure because the lead core line is what pulls the lure down. Also, the line is colored in 10-foot increments so you can get the same amount of line out every time. Each color of line sinks about five feet, so if you have five colors out, the lure will troll about 25 feet deep. You may have to use a larger reel to hold a hundred yards of lead core line. When using lead core line, the line stays at the most constant depth if you troll in a straight direction. Anytime you turn the boat, a slight change in speed occurs thus altering the depth.

After trolling for a short while, you will learn much more about a particular lake. Make a mental note of where you caught what, or you can do like me and make notes on a map of the lake. You can always come back to these spots and fish them more thoroughly with a Carolina rig or deep-diving crankbait. It's a wonderful alternative to try when other methods aren't working, and it's an excellent way for a youth or novice to hook up with a good fish. You never know, you just might end up catching a fish of a lifetime.

Jeremy Grady is a freelance writer in Morganton and an occasional contributor to Wildlife in North Carolina.



Opposite page: A depth finder is a good tool for finding bottom structure that might attract fish, such as a point. Top: Check monofilament line often for abrasions. The size and angle of a bill on a crankbait determine how deep they dive and how tight they wiggle during retrieve or trolling. A nice walleye is this angler's reward.

BOTANIZING WITH

Bullard

With no formal horticultural training, retired dentist A.J. Bullard has carved a niche as one of the state's preeminent botanists

written by
SIDNEY CRUZE
photographed by
MELISSA McGAW

The mulberry tree stands 30 feet tall, its heart-shaped leaves shaking gently in the breeze. A.J. Bullard grins and gestures toward it, hand stretched overhead. "This is my favorite, what I sometimes call my pet," says Bullard, a retired dentist from Duplin County. "I imported it from Islamabad and named it Pakistan Alba. The fruit will grow up to four inches long, and it's tasty. And even though it's dark—almost black—it won't stain your hands."

Bullard explains that his favorite tree is a white mulberry *(Morus alba)*, not the red mulberry *(Morus rubra)* native to North Carolina, and that many of the mulberries we see in our state are hybrids of the two. "This happens easily because the whites and reds have the same number of chromosomes," he says. "And that's a good thing, because these hybrids make the best-tasting fruit."

Bullard loves the taste of mulberries. His parents planted them as forage for pigs and poultry, and he ate them fresh from the tree as a boy. At one time he had 115 varieties planted in his Calypso orchard. Today his orchard includes 14 varieties, along with 39 other species of fruit and nut trees, shrubs and vines. He also has a small arboretum that includes most of the oaks, hickories, ashes and elms native to North Carolina.

People come from across the state and around the world to see both Bullard and his orchard. His knowledge of plants, especially the vines and woody plants of the southeastern Coastal Plain, is as impressive as his collection. Even more impressive is the fact that he acquired it on his own, with no formal horticultural education. Today Bullard is one of North Carolina's most respected botanists. He also is an enthusiastic teacher, and after a lifetime spent studying nature, he is committed to sharing what he knows.

Bullard's interest in the natural world borders on obsessive, and he has felt this way for as long as he can remember. Growing up on a farm in Sampson County, he was surrounded by gardens, orchards and animals. "Yet I wasn't surrounded by answers for all my questions," he says.

As a child, he was curious about trees and plants, and he constantly asked his parents and his uncle to identify what he saw. "My mom and dad knew most of the answers, but with Uncle Norwood, all my questions sort of got old. So he directed me to the herbarium at N.C. State University."

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His first specimen—a small shrub commonly known as horse-sugar—was mailed with a 3 cent stamp. He quickly learned that when he sent a pressed leaf or flower to the Raleigh address, he got a letter outlining details about the plant in return. "I wasn't a teenager yet, but they thought I was an adult and addressed all their correspondence to Mr. Bullard. It's amazing how indelible it was to get that information. I continued doing it for years, through three herbarium directors and numerous assistant directors."

Bullard spent his youth milking cows, playing baseball and going to school. He attended the University of North Carolina at Chapel Hill, where he met his wife Barbara, and the couple moved to a Duplin County farm in 1967. He worked as a family dentist in Mt. Olive for almost 28 years, retiring in 1992.

But he never stopped asking questions about plants. Thanks to an almost-photographic memory, he remembered the answers, and he can now describe in detail over 400 common botanical species found in North Carolina.

"It's really amazing what A.J. has learned by himself. His depth of knowledge puts him on par with other experts, specifically when you talk about the woody plants of the southeastern Coastal Plain," says N.C. State biology professor Jon Stucky.

Tall and thin, with hazel eyes and a direct gaze, Bullard still lives in Duplin County on the same farm, where fields of soybeans bake in the sun. The real bounty is behind the house, though, where Bullard grows at least 150 varieties of fruits, nuts and grapes. He has figs, pomegranates, dessert pears, nectarines and apples. North Carolina natives, such as blueberry and huckleberry, thrive in his orchard, as do exotics such as kiwis, Japanese raisin and Chinese dates.

Bullard is known across the Southeast for his fruit-grafting expertise, and is intent upon seeing his plants thrive. But his trees are not for sale, and his research doesn't focus on yields or fruit quality. "Anyone who will study 43 different fig cultivars, like A.J. did, is a serous orchardist," says Warsaw horticulturist Sean Gurkin. "He's also a great authority on what's hardy in his area, because he's kept meticulous weather records since he was 11. But he's not a typical orchardist. I think he's more concerned with pure knowledge."

Now over 70, Bullard can often be found with his plants. He is quick to mention that he never missed a day of work in his life. "I'm also proud to say I run six days a week, and have done so every week of the year since 1967. To date I've logged over 63,000 miles."

His approach to health can be called old-fashioned—he doesn't eat refined carbohydrates, and believes in exercising both body and mind. He also grows a lot of his own food, including those mulberries, which he touts as high in antioxidants and resveratrol, a plant compound believed to have anti-aging properties.

Yet Bullard's orchard produces more than healthy food; it also generates botanical data. If he gets curious about a particular species, he plants it at home, then watches it grow and change through the seasons.

"He studies his plants day-in and day-out, and he pays close attention to the details. It's one reason he's such a storehouse of information," Stucky says.

Another reason for the depth and breadth of Bullard's knowledge is that he spends as much time talking with people about plants as he does examining them. These days, if he has questions about a particular plant, he takes a specimen home and starts researching. "He'll call any botany professor anywhere to ask, 'What can you tell me about this plant?'" says Jim Slye, a Wayne County forester with the N.C. Division of Forest Resources.

Over the years Bullard has created a personal network of botanists—most of them professors—that spans the Southeast. He also has found friends, such as Slye, who like to join him in the field. The two men met years ago, when Slye was working as a forestry instructor at Wayne County Community College. "He called to ask about an insect problem he had with his pecan trees. We started talking trees and hit it off," Slye says.

Since then they have spent hours together, identifying the plants they do know and researching the ones they don't. Slye says he's never met anyone who will look at a

Left, top to bottom: Hop hornbeam, mountain laurel and zenobia. Opposite page: Visitors come from all over to visit with Bullard and tour his orchard, which has at least 150 varieties of fruits, nuts and grapes. Bullard is especially known for his expertise in grafting fruit trees.

plant as closely as Bullard will. "He often finds the minutiae, those detailed traits that help identify plants that you can't find in botany books. You don't know how hard it is to find people who have an interest in examining plants at this level of detail," Slye says. "We enjoy doing it together."

For Kelly Hines, a NCSU graduate student, Bullard's attention to detail is helping her complete a master's degree. Hines—who met Bullard through Stucky—is conducting the first baseline inventory of the flora in Howell Woods, a 2,800-acre nature preserve in Johnston County. One November Bullard walked the entire preserve with her, helping her identify the many different types of oak and hickory trees living on the preserve.

"One question I had was about the difference between caryas—the hickories—and the juglans, or walnuts," Hines says. "Both have a compound leaf so they look the same, but A.J. showed me there is a different vein structure inside part of the twig called the pith. Juglans have a chambered pith, while the carya has continuous pith."

Many traditional botanists use reproductive traits, or flowers, to identify different species. Over the years, Bullard has taught himself to use other characteristics—a practice referred to as "winter botany"—as well. In one instance he showed Hines how to use glands on the back of a leaf to identify a plant.

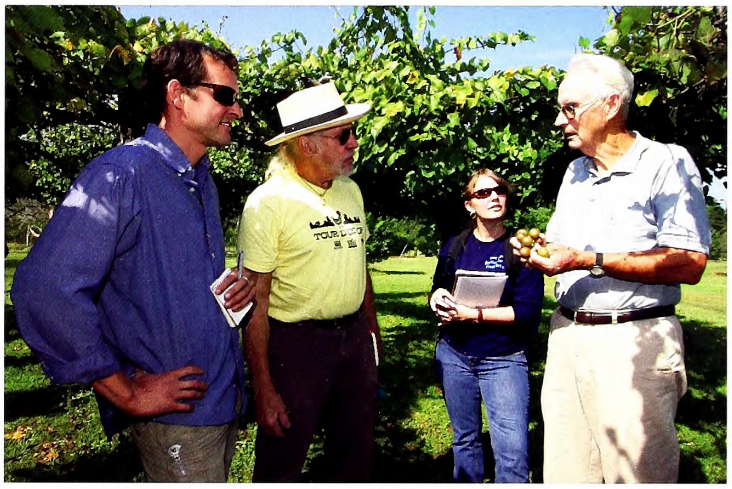
"The Gaylussacia genus, what people would call blueberry bushes, looks a lot like the genus Vaccinium. But the Gaylussacia have yellow glands on the back of the leaves, and when you rub them, your hands turn yellow. The Vacciniums don't have those glands," she says.

Bullard calls himself "a born teacher," and believes we all should help others learn. Since retiring he has taught master gardening classes and college botany courses and led numerous field trips and orchard tours. When a group of students from Mt. Olive College visits the orchard, he peppers them with questions: Can anyone identify this pine tree? How old do you think this oak tree is? Have you ever tasted a sparkleberry?

For Bullard, if a picture is worth 1,000 words, a smell is worth 1,000 pictures. So he asks the students if they can describe the smell of Florida anise leaves. At first, he is answered with silence, but before long, the students begin crushing the leaves, and talking about the licorice-like scent. When they see the kiwis, they start asking their own questions.

"If they show any inclination to learn this, I'm going to try to make sure they do," he says.

For Gurkin, who also has spent hours "botanizing" with Bullard, this willingness to help others learn makes the retired dentist a hero. "I say that because he loves knowledge and he loves to share it. Most people with his genius don't. He goes out of his way to do it."



In 2009, Bullard began writing a weekly column titled "Botany with Bullard" for the Mt. Olive Messenger. Each one includes a mix of botany, gardening advice, plant lore and local history. Columns have focused on subjects such as the history of the cotton industry or the wonders of grafting. Bullard also writes about specific plants, such as sweet potatoes, fringe trees and persimmons.

"He takes the mystery out of plants for people, and explains how they relate to his experiences growing up," says Steve Herring, a reporter for the Messenger. "Many of our readers can relate to these experiences, and that makes the columns very popular."

Readers and friends alike know that plants are just one of Bullard's interests. He learned to play the guitar in his late 50s, and can play over 400 songs without music. At 14 he memorized baseball statistics for 640 major league players, and he remains a rabid Yankees fan in spite of his Southern roots. The naval stores industry, which used pine trees to produce turpentine for wooden ships, is another subject he loves to discuss.

Yet with Bullard the conversation always circles back to nature. Talk with him long enough and you'll learn he can identify the calls for all 30 species of toads and frogs found in North Carolina. He also can tell you what bluebirds feed to their young, why some wasps lay eggs on tomato horn worms and how monarchs survive their migration.

"Nature just fascinates me," he says. NCSU horticulture professor Will Hooker is glad Bullard likes to share this fascination. Hooker takes his students to visit him every September, so they can taste his figs and grapes. "We eat the whole time we're there. It's delicious," Hooker says. "A.J. is a great orchardist, one who's good at explaining what he does. And people across the state listen to him. I know farmers and nursery owners who always want to know what he's growing, so they can try it too. Plus, he's an amazing botanist."

With his keen appreciation for nature and how it operates, Bullard is a naturalist in the truest sense. Those fortunate enough to spend time with him are guaranteed to see new wonders in the world around them.

Durham writer Sidney Cruze is an occasional contributor to Wildlife in North Carolina.

Of all the early lure manufacturers, Heddon is perhaps the best-known. Here are Heddon classics from about 1920 through 1940. Clockwise from the top: Zaragossa, Vamp, 100 Dowagiac Minnow, Zig-Wag, 1600 Wiggler, Flaptail, Lucky 13, Florida Special, two Bassers (metal lip plates), Crab Wiggler, Gamefisher, SOS (Swims on Surface) and Tadpolly (red spots).

Classic BASS LURES

PART 2 of 2

A brief history of bass lures, rods and reels, with emphasis on the golden age of bass fishing from 1900 to 1940.

The acknowledged father of bass fishing, Dr. James A. Henshall, clearly despised the rapid evolution of bass fishing that took place in the early years of this century, but not even his influence could slow the explosive transition. Henshall's time-honored use of natural bait fell by the wayside as more and more anglers switched to the newer brightly colored and innovative wooden and metal artificial bass lures delivered by more efficient revolving spool reels and what Henshall called those "murderous" short casting sticks.

In the years after 1910, their popularity extended into the Southeast, where largemouths were native to most waters. Florida, famed for its monster largemouths, became a fishing destination for well-heeled fishermen traveling from the north. To a lesser extent, North Carolina also attracted traveling fishermen, especially those wishing to fish the picturesque blackwater rivers of the Coastal Plain, or such nationally well-known brackish bass hotspots at Currituck Sound and Colington Harbor behind the Outer Banks.

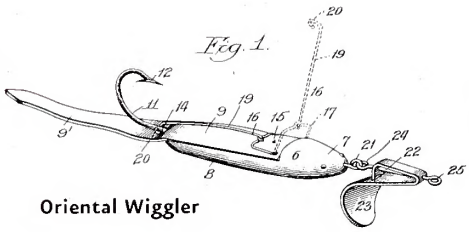
Many early casting lures were metal. Some were spoon-shaped and designed to wobble, while some had spinner blades. This Al Foss Shimmy Wiggler had both, along with wire weedguards and a deer-hair skirt. These were deadly, especially with a strip of pork rind on the hook.

Though very few of the brightly-colored wooden, glass-eyed lures that we associate with classic bass fishing were conceived or manufactured in the Southeast, they were certainly being sold here after about 1910, and were in standard use throughout much of the region by the 1920s. Local fishermen could find good stocks of popular plugs and other gear in many hardware stores and especially in local tackle shops located alongside favorite fishing waters where boats could often be rented and fishing guides hired for outings.

What would you find in the tackle box of the typical North Carolina bass fisherman of this era? Lures were fairly pricey at .75 to $1.25—a day's wages or more—and the Great Depression made those prices more formidable. Bass fishermen didn't carry the dozens, or hundreds, of lures typically found in today's tackle boxes. Indeed, you might expect to find only two or three lures, perhaps half a dozen for an affluent gentleman angler. George Perry, who is credited with catching that first world record 22-pound, 4-ounce largemouth in Lake Montgomery, Georgia in 1932, reportedly owned only the lure he used to catch his prize—a Creek Chub Wiggle Fish in perch scale color.

Yet, the popularity of bait-casting tackle (arguably a misnomer considering that it was applied to fishermen using short rods to cast artificial lures rather than bait) was rampant by the 1930s, and fishermen had a virtually unlimited number of lures to choose from.

Because there were already quite a few sinking lures designed to be trolled available prior to 1900, many of the earliest lures meant to be cast were also underwater lures. Metal lures were particularly well-adapted to casting and retrieving, and refinements made them even more effective. There were hundreds of varieties, but those made by Al Foss came to dominate the field, particularly the Oriental Wiggler introduced in 1917 and the Shimmy Wiggler in 1919. Both had wire weedguards, a desirable feature around weedy cover. The Shannon twin-spinner, another popular and somewhat weedless underwater lure, was arguably the prototype for the modern spinner bait. A number of weighted sinking lures



Oriental Wiggler

also had lips of metal or wood that made them wobble upon retrieve, innovations that were soon adapted to floating-diving lures.

Yet, one particular style of underwater lure typifies the golden era—the weighted wooden, glass-eyed minnow with propellers fore-and-aft. Virtually every manufacturer made these, or adapted them from earlier trolling baits. Most had five treble hooks—smaller versions had two or three—and they were deadly-looking, albeit handsome, critters that sported an incredible array of colors and fancy scale patterns. Heddon's editions included the early "Killers," followed by the Dowagiac 150 and 100 round-bodied minnows introduced about 1905, and the similar Dowagiac 00 and 0 minnows which appeared in 1912 with the round body replaced by a diamond-shaped angular body. Often, manufacturers offered several variations of underwater minnow through the years. For example, Pflueger's minnows included the Monarch, Electric, Neverfail and Peerless. Many smaller manufacturers also made these underwater minnows. Indeed, some companies that pre-dated 1900 were bought out by bigger companies—Rhodes by Shakespeare and Worden by South Bend, for example—primarily because their underwater minnows were already popular and in production. At a quick glance, these underwater minnows are often mistaken for very similar top-water lures that followed—until, of course, you realize that they have internal belly weights. No doubt, with all those dangling hooks, many of these lures were snagged on weeds or submerged stumps and lost.

Once it was discovered that bass would strike on the surface, floating lures proved immensely popular, and top-water plugging was considered the most sporting and exciting method of catching bass—a view that persists today. From roughly 1910 through the 1940s, the top-water lure was king.

The collared Heddon Slopenoses and Experts were immediately successful, and the later 200 series variations remained popular through the years. Among the many other favorites—far too numerous to list—were the fluted Wilson Wobbler (about 1910), Jamison Coaxer (about 1910), and a series of floaters with wooden collars called woodpeckers that were made by Moonlight, South Bend, Shakespeare, Heddon and others. Also very popular were the Decker, Jersey Queen and Pflueger Globe lures (all with props mounted on a revolving wooden head).

Floating lures that featured fore-and-aft propellers like their underwater prototypes were made by nearly every manufacturer. The Pflueger Kent frog was an early favorite, followed later by the Creek Chub Crippled Minnow, Heddon SOS (Swims On Surface) and South Bend Surf-Oreno. The Creek Chub plunker appeared in 1939, and became the most popular of a category of lures with cupped mouths designed to "chug" or "pop" when worked.

One enduring favorite (still available in plastic as the Zara Spook) was the Heddon Zaragossa, a tapered cylindrical wooden surface lure with glass eyes introduced in 1922 that could be manipulated so that it zigzagged back and forth on the surface, a tactic called "walking the dog." So enticing was this lure that it was named after a famous street in Pensacola, Fla., where women of questionable repute were said to strut their stuff.

One of the all-time favorite top-water lures was, and still is, the Arbogast Jitterbug, initially introduced with a wooden body and a wide metal lip in 1940. During World War II, with metal at a premium for the war effort, it featured a plastic lip. The wooden body was replaced with a plastic body after the war. Another popular Arbogast floater that's still around is the Hula Popper, which was made of plastic and introduced in 1948.

Despite the popularity of top-water lures, it was a category of hybrid lures designed to float and dive that spawned the greatest variety of curious innovations and patents. The early models were made of wood, often with some sort of metal or wooden lip, and plastic versions of many of them exist today. There are so many floating-diving lure variations that space permits the mention of only a handful. The Creek Chub Wiggler was an early favorite, possibly introduced as early as 1906 although its metal lip was not patented until 1920. Beginning about 1914, a series of classic wooden Heddons—the Deep Diving Wiggler, the Near Surface Wiggler and the Crab Wiggler—all had metal lips that would cause the lure to dive just beneath the surface and wobble when retrieved.

Clearly, the Rush Tango introduced in 1914 was among the most influential of these early divers. It was made of wood with a long wooden lip, it was highly effective, and it strongly resembles modern crankbaits. By the early 1920s, a floating-diving lure was a "must-have," and there were countless models made by every major manufacturer. Among the most popular—with some of them still made—were Heddon's Vamp, Lucky 13, Gamefisher, River Runt and Pumpkinseed. Creek Chub offered its Wiggler, Wigglefish, Wagtail Chub, Beetle and Pikie Minnow. South Bend virtually made its reputation with its famous Bass Oreno, while Pflueger had the Pal-O-Mine, and Shakespeare had the Egyptian Wobbler. A host of manufacturers made wooden darters so similar that they are difficult to identify by maker. Floating-diving lures that imitated mice or frogs in shape or coloration were also extremely popular—Shakespeare and Heddon

One particular style of underwater lure typifies the golden era—the weighted wooden, glass-eyed minnow with propellers fore-and-aft.

This early Heddon 150 Dowagiac Minnow carried five treble hooks, spinners fore and aft, internal lead weights and hand-painted gill marks. These were more typically trolled.

In North Carolina, black-water coastal rivers and old mill ponds were favored bass fishing spots long before the construction of huge reservoirs. These two modern anglers are re-living the past, casting classic old lures around boat houses and beds of lily pads on a century-old millpond.

both offered swimming mice, and Paw Paw offered its Croaker covered with genuine frog skin, and also its Wotta-Frog.

Some would mark the end of the golden era of bass lures by the development of modern injection-molded plastic that was far more stable than celluloid and Pyralin. Though many of the classic lures continued to be made of wood through the 1940s—and a few still are—plastic had largely replaced wood by the mid-'50s. Other important changes included the use of painted or tack eyes to replace the handsome glass eyes, and painted finishes that were, ironically, neither as handsome nor as durable. Metal parts such as propellers and lips were made more cheaply, and the combined result was a general loss of appeal and quality. Also, GIs returning from Europe introduced U.S. anglers to a new type of reel developed by the French, and the spinning reel greatly influenced the design and manufacture of lures and tackle.

Today, collectors of antique bass fishing tackle concentrate on lures, tackle and advertisements that pre-date 1950, although there has been growing interest in later plastic lures because they are much easier to find and can be bought or traded-for reasonably. Even so, a lot of early fishing tackle still exists, and it can be found sitting in attics and occasionally offered at yard sales and flea markets. Unfortunately, the general public has heard of high prices paid for a few of the most rare and desirable lures, and this has accelerated the perception that all old lures are valuable. It is not unusual to find outrageous price tags on a pile of used and battered lures with rusty hooks at an antique store or yard sale—even

though some of those lures are worth very little and can even be bought new at the tackle shop down the street.

Those who are fascinated by old lures and tackle would be well-advised to learn as much as possible about the subject before they begin writing checks and starting a collection. There are numerous reference books that identify old lures, rods and reels and provide the interesting histories that accompany them. Some references also give rough values which are helpful; however, the novice collector would be wise to take such evaluations with a grain of salt—some are too low, some too high. Value is often influenced more by the condition, color and manufacturer than by age, and some of the lures made by small, independent companies are the hardest to find. To truly grasp the intricacies of identification, and get an accurate understanding of value, it is enormously instructive to join a collecting club, attend lure swaps, and get on the mailing lists of those selling or trading old lures and tackle. There are lure collecting clubs in many parts of the nation, but serious collectors should also consider joining the National Lure Collectors Club, POB 509, Mansfield, TX 76063. Annual U.S. dues are $35, and for this fee you get regular newsletters, news of swaps or conventions and mailing lists. You may also access the club's website at nflcc.org.

In recent years, more and more old lures and tackle are being sold or traded on the Internet, particularly eBay. While experienced collectors may occasionally find a prize, that may be the exception rather than the rule. You are competing with countless collectors, many with more experience, and you have only the seller's description and perhaps a photo to judge by. Bids are also often withheld until the last moment, making it easy to get caught up in the race and pay too much.

It is hardly surprising that lures and tackle from the early half of this century have attracted such a devoted audience. Many of these items are well-crafted and handsome, and they not only bring back fond memories for older anglers, they pluck nostalgic chords for long-gone times when the water was always dark and sparkling, the blue sky was filled with billowing clouds, the redwing blackbirds sang to us, and whopper bass crashed through lily pads to engulf our wooden, glass-eyed lures.

Jim Dean is a former editor of Wildlife in North Carolina *and continues to write a column, Our Natural Heritage, for the magazine.*

SUNFLOWER

FARMING for WILDLIFE

WRITTEN BY MIKE ZLOTNICKI // PHOTOGRAPHED BY MELISSA MCGAW

Need a place to hunt? Two million acres are available, some of it enhanced by agriculture

IN the mid-1980s fresh out of journalism school at Carolina, I settled into life in the Triangle. Being an outdoorsman, I needed a place to hunt. Short of funds and with no land to speak of in the extended family, I drove out one summer day to explore the Jordan Game Lands.

The first stop was at one of the public dove fields, which, to my surprise, had a healthy crop of sunflowers. I returned with my Remington 1100 in the fall for some wing shooting and have never really left.

The N.C. Wildlife Resources Commission's Game Lands Program has over 2 million acres of land (including national forests) and actively manages about 480,000 acres. The game lands are owned by the state, leased, or co-managed with entities such as the U.S. Army Corps of Engineers and the U. S. Forest Service.

TODD PUSSER

On those lands, the commission does quite a bit of "farming" and other management for the benefit of hunters and other users. For fiscal year 2012–2013, seeding and or fertilization was planned for 3,489 acres of food plots, dove fields and other habitat. Waterfowl impoundments are also managed for plant production. The estimated cost is $1,800,000 and is funded primarily by license fees, forest product sales, and funds from the Pittman-Robertson Act, an excise tax on sporting arms, archery tackle and ammunition.

"The primary purpose is to provide hunting opportunities and the conservation of wildlife species," said Isaac Harrold, land program manager and a 26-year veteran of the commission. "It's always been our intent to allow non-hunters use of these lands as long as they don't displace the primary users."

The public dove fields are popular places in September. Chris Teague was taking a break from desk duty to drive around the dove fields and waterfowl impoundments off Brickhouse Road at Butner-Falls of the Neuse Game Land. He spent 20 years tending the grounds there before becoming supervisor of five depots that service more than 100,000 acres.

"On a good opening day we'll have between 200 and 500 people," he said as he wheeled his Ford truck around. "Even on a bad bird day we'll have 150 to 200."

He pointed to a fallow field. "This is a warm-season grass field," he said. "We busted it in half with a disk to leave some brood habitat. Turkey and quail can use it. This disk row will green up and provide more cover and habitat."

He drove to another spot where corn stalks and the remnants of Egyptian wheat stood. "Our annual food plots offer supplemental food supplies when mast crops wane," he said. "They don't just attract huntable game, but they also serve hikers and birdwatchers. We also promote natural vegetation that helps save money on seed cost and field trips."

Teague said that one group of hunters taking advantage of the food plots were raccoon hunters, as the 'coons would forage on corn in the food plots, giving the hunters a likely place for their hounds to get fresh scent.

"THE PRIMARY PURPOSE IS TO PROVIDE HUNTING OPPORTUNITIES AND THE CONSERVATION OF WILDLIFE SPECIES."

At the depot office a grease-chart calendar was on the wall, and Teague said the monthly "chores" were really just the highlights of the "to-do" list. Depending upon the month the conservation technicians at a given game land may mark timber for sale (the funds return to the program), manage waterfowl impoundment crops and water levels, do prescribed burns, prep crop fields, plant fields, band doves and ducks, conduct fire line maintenance, man deer check stations to collect biological data on harvests, post boundaries, repair gates and maintain wood duck nesting boxes, and that's just some of what was on the board. At Butner, for example, there are 14 tractors, three bulldozers and a motor grader to maintain.

Between Jordan and Butner-Falls of Neuse Game Land there are about 60 wood duck boxes, and Stephen Thomas helps maintain them among his other duties. Thomas said that the nesting boxes have an 80 percent use rate and each nest contains about 10 to 12 eggs.

"We come in early and we know what we each need to do," said Thomas, a Tennessee graduate who has been with the commission for three years. "There's always something happening."

He also said that people recognize the efforts of the technicians. "We get thanked a lot of times," he said. "Deer hunters will come by and say 'thank you for what you do.' A lot of them are from the mountains. The duck hunters are vocal, too."

PIEDMONT

The R. Wayne Bailey-Caswell Game Land is about 18,000 acres of scattered tracts south of Yanceyville. The topography is unique, with steep draws and ridges. The game land is named in honor of the late Bailey, the man who is considered the founding father of modern wild turkey management in North Carolina.

Chris Baranski, Northern Piedmont management biologist with the commission, explained what makes Caswell unique. One significant difference is the CURE (Cooperative Upland Habitat Restoration and Enhancement) project at the game lands. There are almost 6,000 acres divided into seven units from 450 to 1,200 acres in size.

"CURE dramatically altered the landscape here," said Baranski. Instead of traditional 20- to 40-acre clear-cuts, the commission went to as much as 150 acres. The clear-cuts were replanted with loblolly pines on a 10-by-15-foot grid and were sprayed with a selective herbicide to kill hardwood sprouts and reduce competition. The area grows for eight years and then is burned. The result is not just cover for quail, but also for small game and songbirds. The fire lines around each clear-cut are planted with rye or crimson clover. "The firebreaks

Top left: Chris Teague checks an ear of corn at one of the food plots off of Brickhouse Road at the Butner-Falls Game Land. Mowing, pictured, and disking (dirt strip to the right of the tractor) are used in addition to planting to manage land for wildlife. The commission's public dove fields are very popular.

create easier hunter access, and the plantings create brooding and bugging areas for birds," Baranski said.

At Caswell local farmers lease land for crops, with the understanding that 10 percent of the crop stays in the field for wildlife.

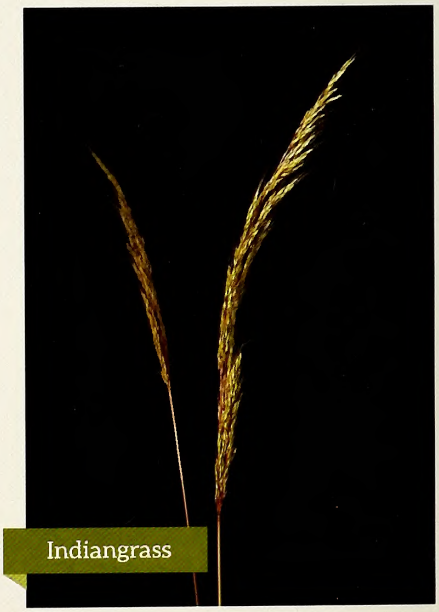
As Conservation Technician Matthew Williams slowly drove past a food plot of clover, a flock of turkey scurried back into the woods. The dove fields at Caswell are smaller than others farther east. "There's not much flat land around here," said Baranski.

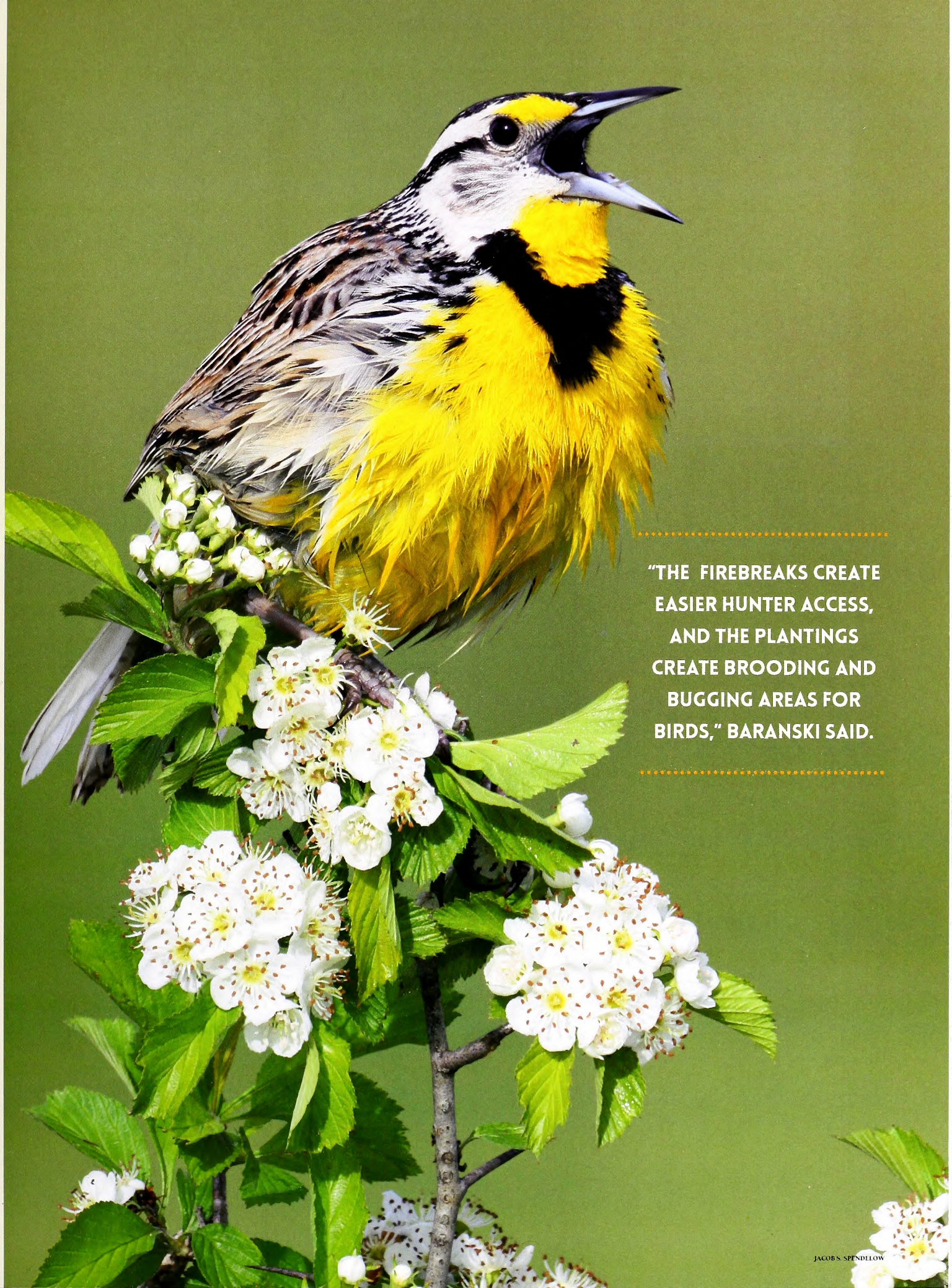
Warm-season grasses like little bluestem, big bluestem, Indiangrass and switchgrass are planted in the dove fields between rows of grain or are planted and left alone to provide habitat.

"It saves money on seed and benefits the rabbit hunters, turkey hunters and deer hunters. It seemed like a waste to manage these fields for one week a year," he said, referring to the popular opening week of dove season.

At one small field, the grasses had fallen over, creating habitat underneath for small game and hiding them from avian predators. Many of the food plots had three defined stages and are not planted. Using successional disking, these fields are left fallow and disked in thirds on alternating years to promote natural herbaceous regeneration. "As land managers of public lands, we take great pride in the stewardship of North Carolina's game lands for the protection of their inhabitants, and the opportunities provided to sportsmen and other outdoor enthusiasts," said Baranski.

Native warm-season grasses, such as switchgrass, big bluestem and Indiangrass provide nesting and brood cover, as well as winter cover, for small game. They are also drought resistant, winter hardy and are adaptable to sandy and infertile soils. Opposite, an Eastern meadowlark vocalizes atop his perch.





"THE FIREBREAKS CREATE EASIER HUNTER ACCESS, AND THE PLANTINGS CREATE BROODING AND BUGGING AREAS FOR BIRDS," BARANSKI SAID.

JACOB S. SPENDELOW

Conservation technicians Richard Clark and Tad Castellow survey the aquatic plants in an impoundment on Goose Creek Game Land.

GAME LANDS BY THE NUMBERS

The commission specifically manages/maintains:

- 4 waterfowl blinds
- 6 observation platforms
- 19 hunting blinds for disabled sportsmen
- 28 hunter campgrounds
- 44 dams
- 49 lakes/ponds
- 64 miles of waterfowl impoundment dikes
- 71 waterfowl impoundments (5, 526 acres)
- 91 bridges
- 228 parking areas
- 1,044 miles of unpaved roads
- 1,209 gates
- 10,924 miles of posted boundary
- 1,413 culverts

Coastal Plain

At the Goose Creek Game Land, waterfowl are a specialty. Dan Martin, central coast technician supervisor, talked about some of the activities on the game lands just west of Aurora. "We manage salt marsh impoundments," he said. "The vegetation in them—food—is created by water level manipulation. We draw them down in mid-spring after the return migration. It's a slow draw-down for shore birds. We leave them dry all summer until the bottoms crack. Then you'll see some plants sprout and seed out and then we'll re-flood."

It's tougher to work at Goose Creek because everything has to be hauled in by barge, a three-hour trip one way for the six impoundments there and 10 in the central coast region. "A ton of time, pumping and fuel hauling," said Martin.

There are 17 miles of dikes that have to be maintained. Throw in a hurricane now and then, and the repair work becomes extremely taxing. It's a popular destination for waterfowlers and Martin knows it. Traffic is heavy, and the game lands also serve a lot of bird watchers and photographers, especially at Croatan.

"The Goose Creek Game Lands are a premier waterfowl hunting area for the eastern United States," he said. "The commission has managed it for the long term. It serves a lot of people. Many a waterfowl hunter has killed their first duck here, and some their last. It's a crown jewel."

This is but a snapshot of what goes on to promote hunting and non-consumptive outdoor activities on the game lands across our state. There are 90 individual game lands scattered across North Carolina in 79 counties. A pool of 87 conservation technicians and staff biologists are ensuring you a quality place to hunt and recreate. Take advantage of it. ◆

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FIRE IS YOUR FRIEND

Since 1944 Smokey Bear has admonished Americans to prevent wildfire. In fact, it's been the longest running public service announcement campaign in history. But what a lot of folks don't realize is that fire is good — even essential — for many ecosystems.

"Prescribed burning is one of the most cost-effective and efficient land management tools we have for improving habitat on the landscape," said Dean Simon, a Mountain Region wildlife forester with the commission. "Burning is a primary duty for all commission foresters. The Piedmont and Coastal areas have been burning for decades. We started burning in the Mountain region in 1987. Now we have a pretty good program on our Mountain game lands thanks to a dedicated, trained, and well equipped staff of wildlife technicians and biologists."

Simon said that the flatter Piedmont and Coastal Plains topography makes for easier burning and that larger tracts of land can be burned with fewer people. In the mountains, fire wants to run uphill, so foresters burn from the top down and utilize more equipment and people. Bulldozers are used to create firebreaks in concert with roads and trails. On flatter ground tractors with disks can create firebreaks. Natural firebreaks, such as creeks and rivers, are also utilized extensively.

Weather, especially wind, temperature and humidity, all play a part when planning a prescribed burn. Late winter and early spring are when these factors come together for the most optimum window of burn opportunities, and the Mountains have the shortest window; the Coastal Plain has the widest. There is also a secondary period from September to December that foresters will take advantage of.

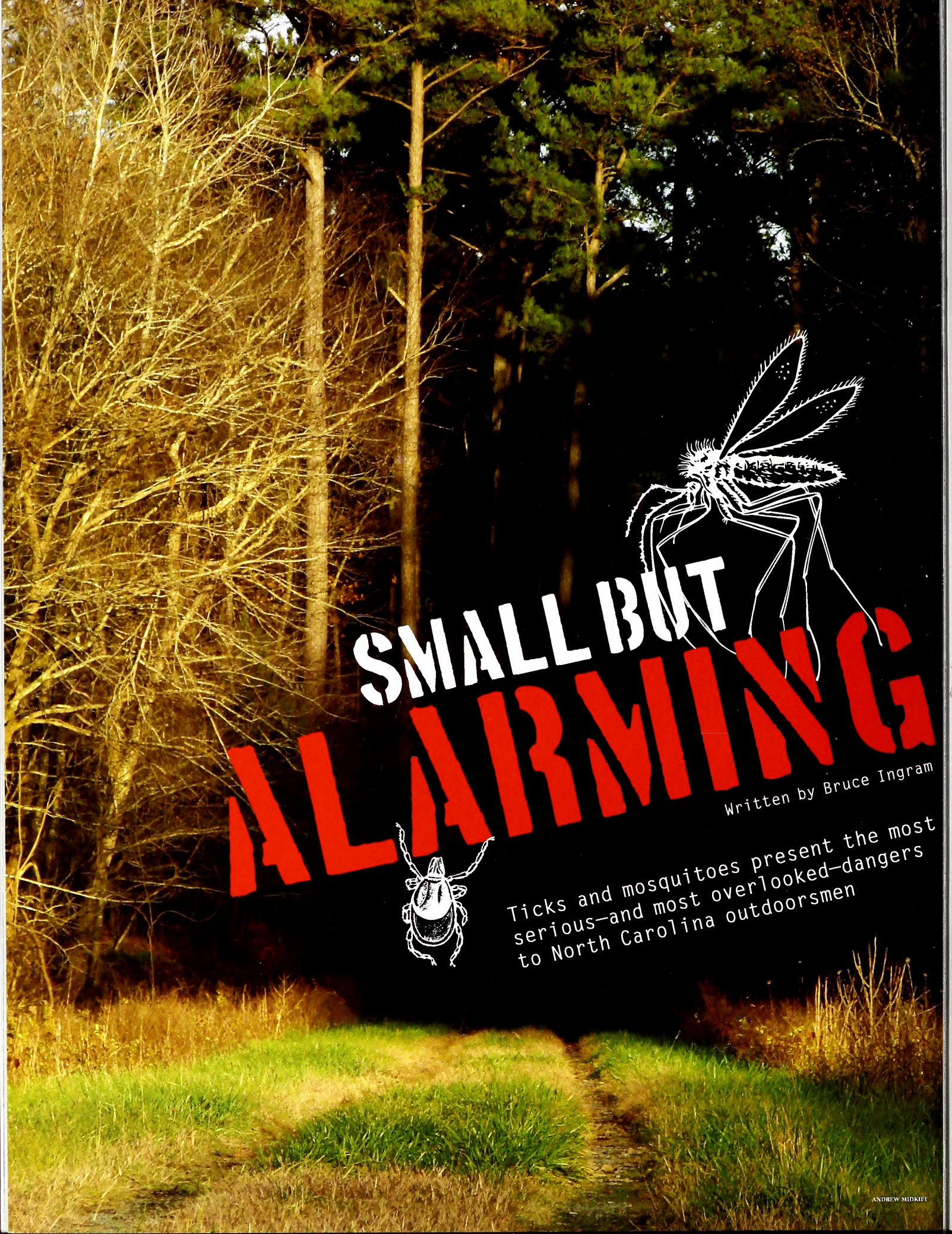
"Training and experience let us know how the fire is going to act," said Simon. "There's a lot of planning that goes into a burn. Prescribed burning is as much an art as it is a science."

The tools of burning include bulldozers, pickup trucks and ATVs with portable water pumping units and hand-held drip torches filled with a mix of diesel fuel and gas to start fires in a planned sequence. On large tracts helicopters are sometimes used to conduct prescribed burns.

Prescribed (or controlled) burning is a literal example of fighting fire with fire. As ground fuels like leaf litter, brush and pine needles build up over the years, the chance of a catastrophic fire from a lightning strike or carelessly thrown cigarette butt grows. Regular burning keeps the fuel supply lower.

"We are using prescribed burning from the mountains to the coast," said Simon. "We have fire-adapted and fire-dependent plant and animal communities in need of restoration and maintenance and this is wildlife habitat management at a landscape level. We know fire intensity, frequency (how often we re-burn), and season (time of year) greatly influence the results of our prescribed burning. Scientific research, much of which has occurred on commission lands, has greatly advanced our knowledge of the need, results and proper application of prescribed fire. There's a lot of complexity across the state, but we've gradually fine-tuned our work."

For more information on prescribed burning go to ncprescribedfirecouncil.org or www.fs.fed.us/fire/management/rx.html.



SMALL BUT ALARMING

Written by Bruce Ingram

Ticks and mosquitoes present the most serious—and most overlooked—dangers to North Carolina outdoorsmen

ANDREW MIDKIFF

FOR FELLOW OUTDOORS FOLK, I offer two examples of outdoors-related animal fears that make no sense. Recently, I had someone tell me that he has a friend who captured a picture of a gray wolf on a trail camera. The individual did not believe me when I told him that that was highly unlikely if not impossible for a wild gray wolf to be living in our region and that the picture was more than likely of just a dog.

American dog tick

Several months earlier while speaking to a sportsman group, I had many individuals claim to have seen mountain lions over the past few decades or had close friends who knew someone who had, and what were wildlife officials going to do about the imminent danger to good citizens. The most implausible tale told involved a cougar striking down a poor, innocent pony just outside of a major city.

This irrational fear of wolves, lions, and tigers (yes, I'm being just a little sarcastic on that last one) in our midst is not what we should be worried about. Indeed, two very dangerous animals—ticks and mosquitoes—dwell throughout North Carolina and their bites can prove at the very least debilitating and at the worst fatal. And anyone who hunts, fishes, camps, hikes or enjoys the outdoors in any kind of way or even strolls into his or her backyard is at risk said Brad Gunn, a biologist with the N.C. Wildlife Resources Commission.

"Ticks and mosquitoes are the two most overlooked dangers in North Carolina's outdoors," he said. "One of the many dangerous things about Lyme disease is that many doctors still misdiagnose what is wrong with someone.

"Also of concern is that a long time can pass between the time someone receives a tick bite and when the disease is correctly diagnosed. It's very important to go to a doctor that knows how to recognize the symptoms because not everyone has the classic bull's-eye rash that the disease is most associated with."

Unfortunately, I all too well know the dangers of ticks and the lack of a bull's-eye rash, as I was diagnosed with Lyme disease (LD) in July 2012. In mid-April I found an attached deer tick (the species that causes this affliction, also known as the blacklegged tick, *Ixodes scapularis*). By May I was suffering from fatigue, and by June my toes had begun tingling—an affliction known as neuropathy and a possible symptom of LD.

In July, I contacted my family physician, spoke of my fear about having Lyme disease, and the doctor ran a blood test. A week later the results came back positive, and I began a 30-day regimen of taking doxycycline twice daily—interestingly, the same antibiotic often prescribed when someone contracts the bubonic plague. If anything hammered home to me the seriousness of LD, it was the fact that I was taking medicine known for its potency in combatting the Black Death.

Fatigue and neuropathy are just two of the early symptoms of Lyme disease. Others include fever, chills, body aches and headaches, all which I did not experience. Later signs include joint pain (especially in the knees), meningitis (inflammation of brain membranes) and Bell's palsy (temporary paralysis

MELINDA FAWVER

JIM OCCI

JAMES GATHANY

GERALD HOLMES

SUSAN ELLIS

An American dog tick on a blade of grass. This engorged female lone star tick (right) is a great example of the phrase "tight as a tick." A lone star tick is shown to scale on a fingertip. Bottom, the mouth of an American dog tick.

of one side of the face). Severe fatigue, eye inflammation, liver inflammation and heart problems such as an irregular beat can also occur, even months after an individual believes the disease has gone away.

Lyme disease is not the only ailment that ticks can inflict. When I was in my early 20s, I worked at an Easter Seal camp for mentally and physically challenged children. One of the boys in my cabin who suffered from the former condition was a 9-year-old who had contracted Rocky Mountain Spotted Fever (RMSF) when he was 8. He had suffered through an extremely high fever that had left him permanently mentally challenged. So began my intense fear of ticks.

In North Carolina, two species carry this disease: the American dog tick (*Dermacentor variabilis*) and the brown dog tick (*Rhipicephalus sanguineus*). Possible early symptoms include fever, headache, abdominal pain, vomiting and muscle pain. Rashes sometimes occur but just like the LD bull's-eye rash, they may never develop.

RMSF can be fatal, or in the case of my camper severely debilitating if not treated within the first few days. The little boy's mother tearfully told me that she thought her son had merely the flu and had treated him with bed rest and aspirin. As is true generally with tick-related illnesses, doctors often use doxycycline to treat RMSF.

The Lone Star tick (*Amblyomma americanum*) can cause a variety of illnesses, among them ehrlichiosis. Fever, headaches, chills, fatigue, muscle pain, nausea, vomiting, diarrhea, red eye and occasionally rashes are among the symptoms. Ehrlichiosis can be fatal if not treated correctly and quickly. However, individuals who are treated early may rebound quickly.

The other major tick-borne plague that exists in this state is spotted fever and is caused by the Gulf Coast tick (*Amblyomma maculatum*) which fortunately dwells only along the coastline. Symptoms are very similar to RMSF.

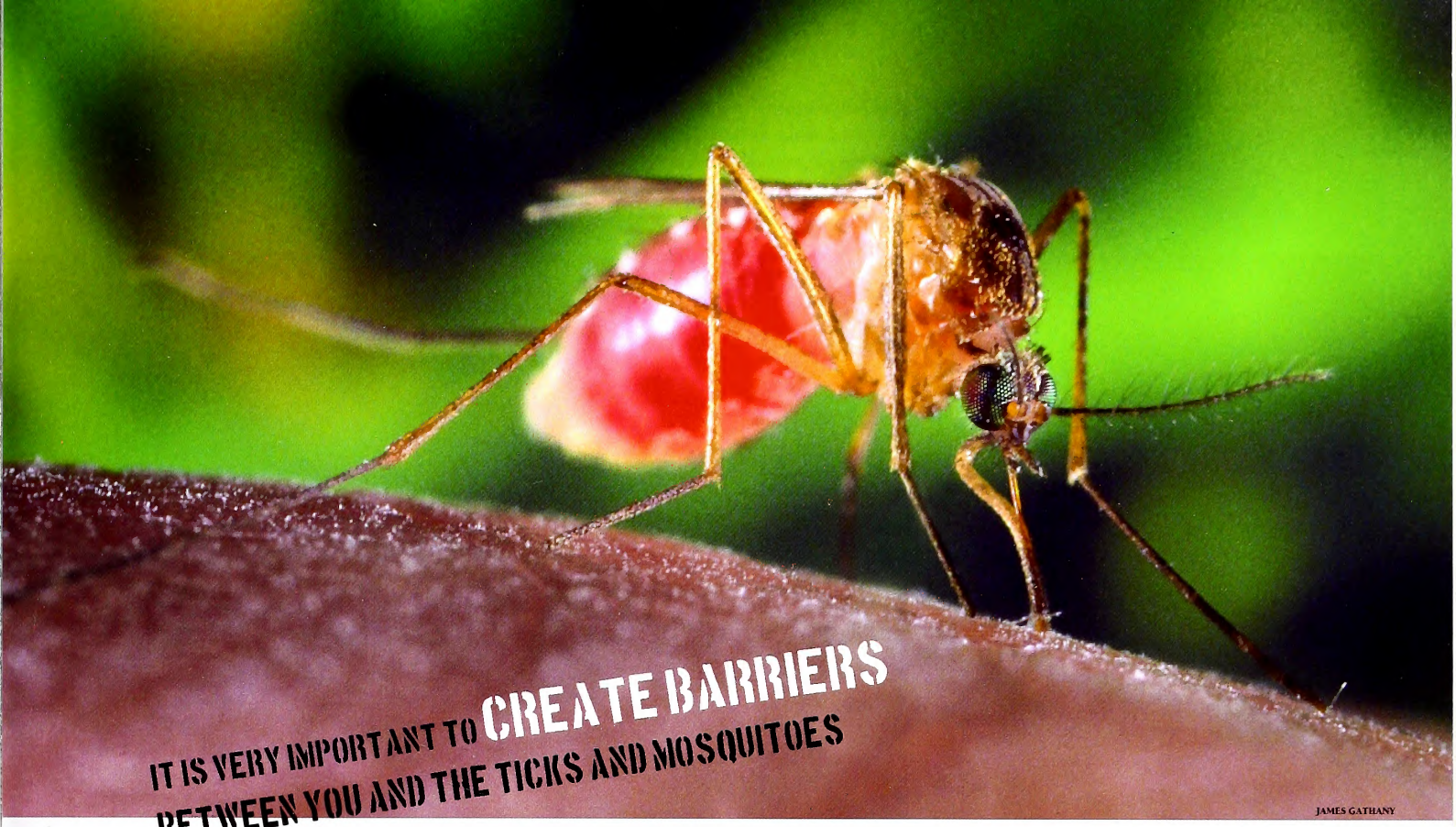
The major mosquito-related plague that exists in North Carolina is the West Nile Virus (WNV). The good news is that North Carolina is not among the nation's leaders in reported cases; the bad news is that this affliction is on the upsurge in the United States. WNV most often occurs in the summer and fall, but with our warmer weather nowadays, I occasionally see mosquitoes even in January and February. The disease is most often spread when humans are bitten by mosquitoes that have fed on infected birds. Only rarely is WNV spread through blood transfusions or organ transplants. It is a myth that WNV spreads through kissing or touching.

According to the Centers for Disease Control (CDC), about 80 percent of all people infected with WNV show no symptoms; and some 20 percent display fevers, nausea, vomiting, headaches, body aches, and sometimes swollen lymph glands with skin rashes on the chest, stomach and back. About one person in 150 develops severe symptoms such as high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis.

Again, according to the CDC, people over 50 are at most risk of developing severe symptoms from West Nile Virus, but, obviously, anyone who goes outdoors can contract the disease. If individuals develop symptoms such as severe headaches or confusion, they should visit their doctor immediately. In North Carolina in 2012, two deaths were attributed to WNV and six cases occurred. In contrast, Texas experienced 76 deaths.

Gunn offers some tips to help prevent bites.

"It's very important to create barriers between you and the ticks and mosquitoes,"



JAMES GATHANY

he said. "That means wearing boots and socks if you're walking through tall grass. It also means wearing long pants, tucking your pants into your boots and wearing several layers of long-sleeve shirts."

Allegra Lowitt, vice president of marketing for ThermaCELL Mosquito Repellent, suggests parents meticulously look over the bodies of their children and search for ticks crawling about or attached, then having spouses check each other. Every time my wife and I venture outdoors during the warm weather period, when we arrive home we check each other for ticks, wash our clothes and take showers. However, this degree of caution did not keep me from developing Lyme disease.

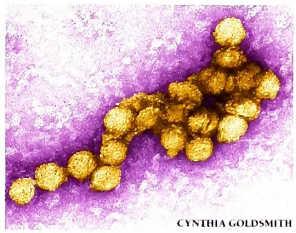
Many products designed to decrease our chances of becoming bitten by ticks and mosquitoes exist. Dave Larsen, vice president of marketing for Gamehide, says his company's ElimiTick line can greatly lessen the possibility of people being bitten by ticks.

"We combined forces with Insect Shield, which created the proprietary long-lasting permethrin treatment which is designed to repel ticks, mosquitoes, chiggers and a number of other insects and is EPA approved," he said. "We then applied that company's technology to our clothing products and came up with our ElimiTick line.

"The result is that a natural repellent bonds to fabric fibers. Permethrin comes from an African chrysanthemum and basically causes ticks and mosquitoes to bail off from clothing. The compound lasts the life of the clothing garment, the standard being 70 washings."

Jason Griffin is president of Insect Shield International, which is located in Greensboro. He explains the company's mission.

"We focus, not only on helping protect individuals from being bitten by insects some of which can carry dangerous diseases, but also in helping companies protect their employees from insects," Griffin said. "For example, we recently supplied clothing to a company that was sending its employees to Africa where such mosquito-borne diseases as dengue fever and malaria are endemic.



CYNTHIA GOLDSMITH

West Nile Virus

"Until our proprietary, permethrin-based treatment technology came along some 10 years ago, clothing that had been treated with a mosquito repellent only worked for a few washings if that. For our product to have received EPA approval, we had to submit data that our clothing is effective in repelling mosquitoes and won't harm the wearer."

Griffin adds that a study done by the U.S. Army showed that permethrin treated uniforms could prevent 97.6 percent of insect bites and when used in conjunction with DEET was 99.9 percent effective.

"Equally as impressive as the mosquito study done by the Army is the one conducted by researchers at the University of North Carolina Gilling's School of Global Public Health," said Griffin. "Outdoor workers wearing Insect Shield treated clothes had 99 percent fewer tick attachments during work hours than workers wearing untreated uniforms."

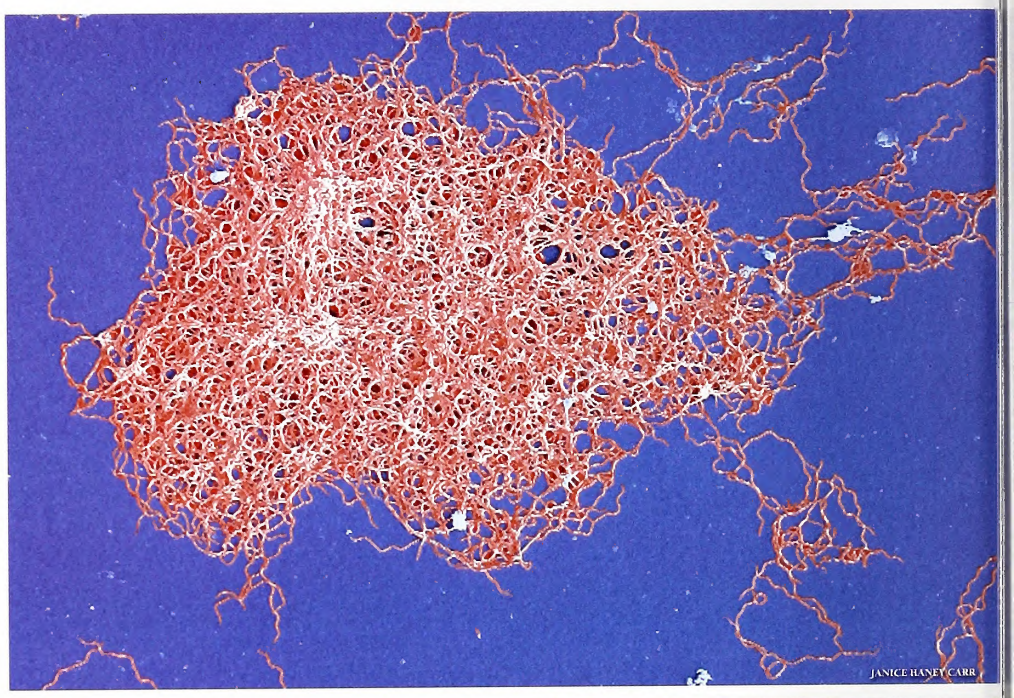
Griffin concludes by saying that since clothing treated with Insect Shield is scent-free, hunters and photographers especially should find it to their liking.

One of the best products I have ever used to repel mosquitoes is the ThermaCELL Mosquito Repellent. Basically, the product creates a 15x15 "no fly zone." A butane cartridge powers the unit, heating a mat releasing allethrin, a synthetic duplication of a natural insect repellent. The mat lasts for four hours and the butane cartridge for 12.

Josh Silva, marketing manager for ThermaCELL, says that because the product

This bull's-eye rash appears in about 80 percent of Lyme disease patients. This digitally colorized electron micrograph (right) shows a grouping of *Borrelia burgdorferi* bacteria that are responsible for causing Lyme disease.

JAMES GATHANY



JANICE HANEY CARR

TODD PUSSER

Why Do Deer Ticks Stay Attached So Long?

See Nature's Ways, page 43.

is based on a natural insect repellent it does not spook game—a prime consideration for hunters. Quite frankly some of the insect repellents I have tried did, I believe, alarm deer, but the ThermaCELL does not from my experience.

Sawyer offers several products that ward off insects, among them Permethrin Premium Insect Repellent and Ultra 30 Liposome Controlled Release, a DEET product. During the early part of the bow season, I like to apply Ultra to put on the back of my neck and ears. Permethrin Premium is designed to kill ticks and repel mosquitoes.

The Tender Corporation/Adventure Medical Kits is another well-respected company in the bug wars with two of the best-known products being Ben's 30 Tick & Insect Repellent and Natrapel. Natrapel serves as a good option for protecting exposed spots while Ben's 30 is a sound choice for applying to foot apparel and clothing.

Finally, Rynoskin, a lightweight, breathable underwear that is nylon/lycra mix, is designed to be worn under camo or other outdoor clothes. Rynoskin contains no harmful chemicals, and insects can't enter through the cuffs or seams or penetrate the fabric.

Pittsboro's Colleen Olfenbuttel, the Wildlife Commission's black bear and furbearer biologist, also had to deal with Lyme disease. She shares her cautionary story.

"In early June of 2012, I was building a trail behind our house and encountering a lot of ticks," she said. "At one point, I was even pulling ticks out of my hair. While I always do a tick check, I wasn't thorough enough and one snuck by me. It found its way to the back of my knee, where it attached itself through the night.

"I remember waking up to an itch behind my knee, scratching at it, then falling back asleep. It was only in the morning that I discovered the tick and I pulled it off immediately. Because I have had tick bites over the years, I didn't think too much of it, especially since it wasn't engorged with blood. However, later that day, I noticed that a rash was developing, and within two days I had a 6-centimeter red rash that was very itchy."

Olfenbuttel says six weeks passed before she received a proper diagnosis; many people take far longer before LD is correctly diagnosed. One doctor even told her that she had a localized skin irritation and that Lyme was rare in North Carolina, which is not true. Within two weeks, however, Olfenbuttel began developing odd symptoms: her neck and arms were red and hot. Then came the uncontrollable tremors in her arms and legs.

"I [then] went to Urgent Care, where they prescribed an antibiotic as soon as I mentioned my tick-related rash from earlier that month," she continued. "The nurse told me that the Centers for Disease Control recommend antibiotics anytime someone develops a rash from a tick bite, and she expressed surprise and disappointment that my primary care doctor hadn't treated me with antibiotics. No tests were done to see what tick disease I had, as I was told the prescribed antibiotic would take care of most tick diseases we have in North Carolina. Then began 21 days of antibiotics.

"I spent the next two weeks on the couch, day and night. I was severely fatigued, yet could not sleep well. I would get hot spots on my neck and arms; I felt awful and couldn't work. I also lost my appetite and about 15 pounds. Because I wasn't getting better, I was referred to various doctors, who gave me various tests and various diagnoses. About three weeks into taking the antibiotic, I started to develop muscle and joint pains and still had no answers as to why I wasn't improving.

"I started to do a lot of research online and discovered that misdiagnoses are common for Lyme disease victims and that most doctors under treat the disease. I also learned that it was important to go to a Lyme-literate doctor, and, luckily, I found one in my area. Unlike the quick in-and-out appointments I had with my other doctors, she spent over two hours with me on my first visit and ordered several blood tests to thoroughly and correctly diagnose me with Lyme. She also stated most of her patients were either misdiagnosed or under treated due to most doctors' unfamiliarity with Lyme disease."

Olfenbuttel also learned that the Lyme bacteria had penetrated her central nervous system and that the bacteria are good at eluding antibiotics. Currently, she is on several antibiotics and her health is improving.

INFORMATION SOURCES

Centers for Disease Control (a wealth of information on tick and mosquito related diseases): CDC.gov

Gamehide: gamehide.com

Insect Shield: insectshield.com

Rynoskin: rynoskin.com

Sawyer: sawyer.com

Tender Corporation: tender.com

ThermaCell: thermacell.com

PREVENT LYME DISEASE

- Wear repellent
- Check for ticks daily
- Shower soon after being outdoors
- Call your doctor if you get a fever or rash

I, too, feel that I am on the upswing, but as is the case with Olfenbuttel, only the time will tell whether we will be fully cured. And here's one more caveat about Lyme disease... an individual can totally recover from this plague, be bitten again by a tick carrying LD, and contract the disease a second time.

I will continue to spend most of my leisure time outdoors, but I will be even more careful about protecting myself. The old cliché—it's a jungle out there—is true, but that jungle is not populated by wolves, lions and tigers but by something far more insidious—ticks and mosquitoes.

Bruce Ingram has written five books on river smallmouth fishing, including one on the New River and "Fly and Spin Fishing for River Smallmouths." For more information and to read his weekly outdoors blog, visit bruceingramoutdoors.com.

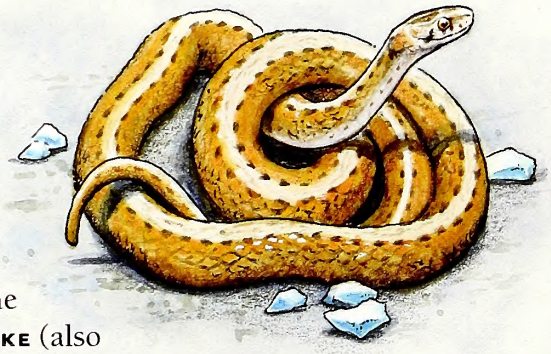
Not all small snakes are babies. Some are just

Little Snakes

written by Jeff Beane / illustrated by Amelia Hansen / nature activity by Anne M. Runyon

You're raking leaves or moving firewood in your yard. You uncover a tiny, grayish-brown snake, smaller than a pencil. A baby snake! Or is it? Not all tiny snakes are babies. Some species are just small. North Carolina has at least nine snake species that can reach sexual maturity at less than a foot in length. Let's meet some of these little snakes, many of which you might see in your own yard.

One of the most common small snakes over most of North Carolina, especially around hardwood forests, is the **WORM SNAKE**, *Carphophis amoenus*. These little snakes superficially resemble large earthworms, burrow like earthworms and eat mostly earthworms as well as some soft-bodied insect larvae. Worm snakes have smooth, shiny scales, plain brown or grayish backs and pink or pinkish-white bellies. Small hatchlings (worm snakes are egg-layers) are slightly more colorful, with darker brown backs and pink-orange bellies. A worm snake won't bite when handled, but it may pry its flat head against its captor's hands and probe with the pointed tip of its tail. The tail spine is harmless and incapable of breaking human skin, but it may startle a predator into dropping the snake.

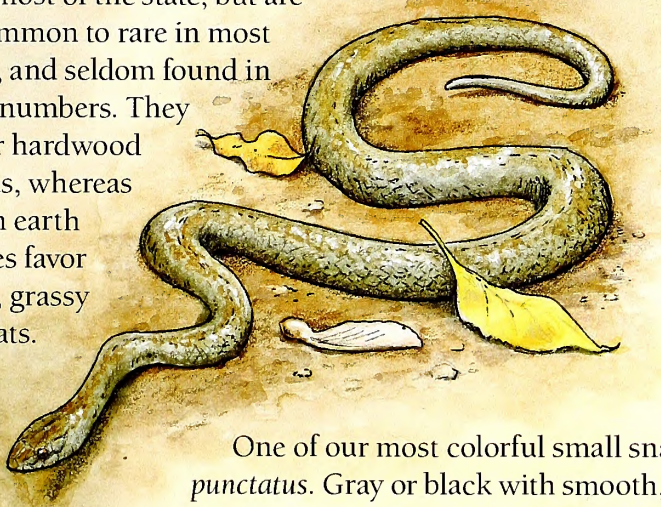


A very common "backyard snake" is the **BROWN SNAKE** (also called DeKay's snake), *Storeria dekayi*. This highly variable species is often mistaken for a small garter snake. It is typically brown, tan or reddish-brown with a pale stripe running down the center of its back, bordered on each side by a row of dark spots that occasionally fuse to form crossbars. The belly is whitish, tan or pinkish, and the head is usually darker than the body. Brown snakes eat slugs, snails and earthworms. They thrive in many urban and suburban areas.

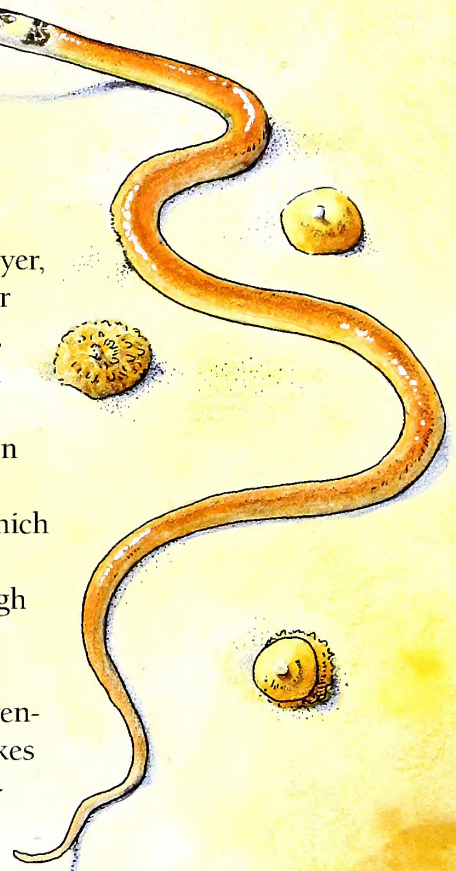
The brown snake's close relative, the **REDBELLY SNAKE** (*Storeria occipitomaculata*), is possibly our smallest snake; males reach maturity at only about 6 inches in length. This snake varies from slate-gray to bright reddish, with a pale stripe running down the center of the back and usually three indistinct yellow or orange spots just behind the dark head. Its belly is bright orange-red. Redbelly snakes eat slugs and snails.

Brown and redbelly snakes bear their young alive. Both have keeled scales—each scale has a narrow ridge or keel running down the center; this is a useful feature for identifying many snake species.

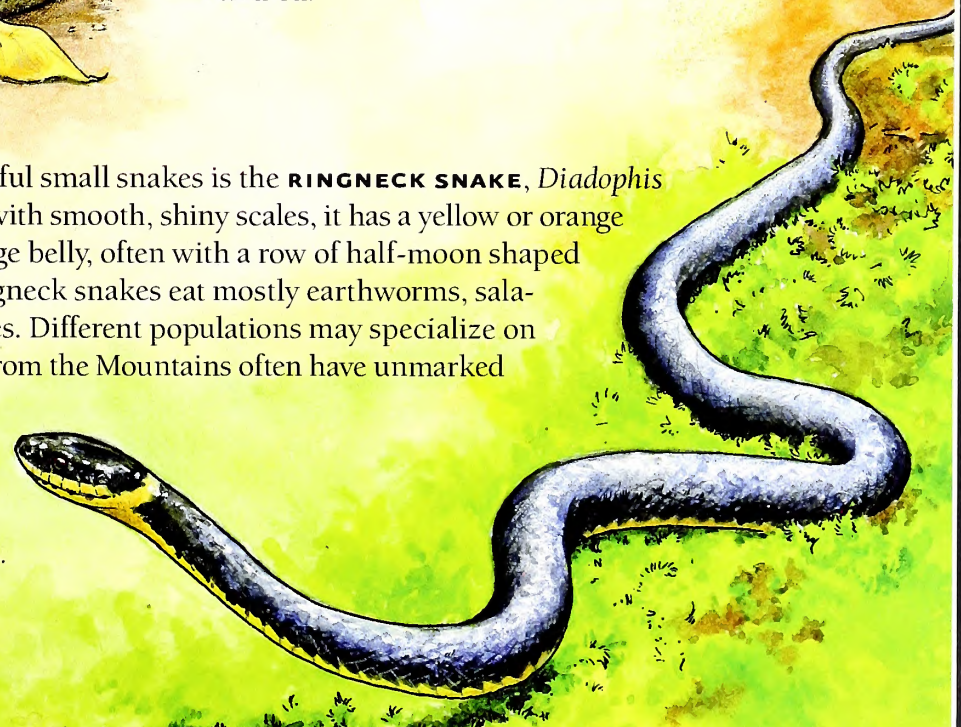
The **ROUGH EARTH SNAKE** (*Virginia striatula*) and **SMOOTH EARTH SNAKE** (*Virginia valeriae*) are small, grayish-brown snakes with plain whitish (occasionally greenish-white or buff) bellies. They are slightly heavier-bodied and less colorful than worm snakes, and are not as well-adapted for burrowing, preferring to hide under leaf litter. Both species bear their young alive. Rough earth snakes have keeled scales distinguishing them from smooth earth snakes, which have smooth scales. Young rough earth snakes have a pale band across the back of their dark heads, which sometimes causes them to be confused with other species. Smooth earth snakes often (but not always) are patterned with small, scattered black dots. Both eat mostly earthworms; rough earth snakes may also eat slugs or other small prey. Rough earth snakes occur over most of the Coastal Plain and Piedmont and are especially common in vacant lots in urban habitats, where multiple individuals may congregate under a single sheltering object. Smooth earth snakes occur over most of the state, but are uncommon to rare in most areas, and seldom found in large numbers. They prefer hardwood forests, whereas rough earth snakes favor open, grassy habitats.



One of our tiniest snakes is the **SOUTHEASTERN CROWNED SNAKE**, *Tantilla coronata*. This secretive species can be common in sandy portions of the southern Coastal Plain and Sandhills, but is uncommon elsewhere in the state. It is a slender, smooth-scaled egg-layer, with a shiny brown or reddish-brown back, black head and black collar separated by a light band, and a plain whitish belly. It eats mostly centipedes, which it subdues with weak venom injected through enlarged teeth in the rear of its upper jaw. Though technically venomous, crowned snakes are completely harmless to humans and do not bite when handled.



One of our most colorful small snakes is the **RINGNECK SNAKE**, *Diadophis punctatus*. Gray or black with smooth, shiny scales, it has a yellow or orange ring around its neck and an orange belly, often with a row of half-moon shaped black spots down the center. Ringneck snakes eat mostly earthworms, salamanders, lizards and small snakes. Different populations may specialize on different prey items. Individuals from the Mountains often have unmarked bellies and wide, unbroken neck rings; they also reach larger sizes. Coastal Plain and Piedmont snakes are smaller with spotted bellies and often broken neck rings. Ringneck snakes are egg-layers. They release a strong-smelling musk when handled.



Did you know that a snake's scales are not arranged randomly, but in symmetrical rows? A worm snake has 13 scale rows at mid-body — the fewest of any North Carolina snake.

If you live in the pine flatwoods in the southeastern corner of the state, you might be lucky enough to see the **PINE WOODS SNAKE**, *Rhadinaea flavilata*. Formerly called "yellow-lipped snake," this uncommon, smooth-scaled snake is iridescent reddish or golden-brown with a slightly darker head that is marked with a dark stripe on each side, and a plain yellowish or whitish belly. It inhabits pine flatwoods and eats mostly small frogs and lizards. Like the crowned snake, it has fangs in the rear of its upper jaw and weak venom, but it, too, is completely harmless to humans and does not bite. It is an egg-layer that releases an especially potent musk when handled.

Some little snakes you see may really be babies. If you see a little snake with blotches, bands or other bold pattern, chances are it's a young rat snake, racer, water snake, garter snake or other species that will someday grow larger.

The **BLACK SWAMP SNAKE**, *Seminatrix pygaea*, is a smooth-scaled, semiaquatic species rarely encountered in North Carolina and is one of our more poorly known snakes. Shiny black with a bright red belly, it inhabits swampy ponds and ditches in the outer Coastal Plain, usually hiding in aquatic vegetation and feeding on small fish, amphibians, worms and leeches. Young are born alive.

Get Outside

You should be able to find little snakes in your backyard or neighborhood. Look under logs, boards, flat rocks, leaf litter, or other sheltering objects. Always be very careful when turning such cover, since some biting or stinging animals can be found in these same places. Never handle a snake unless you're sure it is nonvenomous. Our six venomous species are boldly patterned and easily recognized, and most are larger and heavier-bodied, even when first born, than any of the species described here. Any tiny, uniformly colored snake in our area is harmless. Always carefully replace rocks or logs after turning them. If you find a small snake (or any other animal) under a large rock or other heavy object, it's usually best to move it before replacing the object; otherwise you could easily crush the animal. If you can, take photos of the little snakes you see; this can help you identify them, as well as recognize individuals if you see them again. Most of our "little snakes" make poor captives, so they are best left in the wild. If you do keep small snakes (or other creatures) for short periods as temporary captives, it's important to release them back exactly where you found them.

All these little snakes are harmless to humans. They rarely if ever bite, and their teeth are in any case too tiny to penetrate our skin. For defense, they rely on hiding and on their bad-smelling musk, which repels some predators. Most have lifespans of about seven to 10 years, but some can live longer.

Read and Find Out

- "Reptiles of North Carolina" by William M. Palmer and Alvin L. Braswell, University of North Carolina Press, 1995.
- "Amphibians and Reptiles of the Carolinas and Virginia, 2nd Edition, Revised and Updated" by Jeffrey C. Beane, Alvin L. Braswell, Joseph C. Mitchell, William M. Palmer and Julian R. Harrison III, University of North Carolina Press, 2010.
- "Snakes of the Southeast" by Whit Gibbons and Mike Dorcas, University of Georgia Press, 2005.
- "A Guide to the Snakes of North Carolina" by Michael E. Dorcas, Davidson College, 2004.

Find out more about Project WILD Workshops and literature at the Wildlife Commission's website at ncwildlife.org.

The Wildlife Endowment Fund

An Investment for the Future

Established in 1981, the Wildlife Endowment Fund allows the Wildlife Resources Commission to accept tax-deductible contributions for wildlife conservation. Money from the sale of lifetime licenses is also placed in this fund. Your donation or purchase will ensure that North Carolina will have a rich wildlife heritage for generations to come.

Lifetime License Form

Infant and Youth *(check appropriate block)*:

- ☐ Sportsman Infant $200
  (under 1 year old—Application must be received before applicant has attained 1 year of age.)
- ☐ Unified Sportsman/Coastal Recreational Fishing Infant $275
  (under 1 year old—Application must be received before applicant has attained 1 year of age.)
- ☐ Sportsman Youth $350
  (ages 1 through 11—Application must be received before applicant has attained 12 years of age.)
- ☐ Unified Sportsman/Coastal Recreational Fishing Youth $450
  (ages 1 through 11—Application must be received before applicant has attained 12 years of age.)

A copy of the birth certificate must accompany applications for infant and youth licenses. Birth certificate documentation cannot be returned.

Note: Pending satisfactory completion of the hunter safety course, persons who possess infant or youth licenses may exercise the privileges thereof when accompanied by an adult who is properly licensed to hunt in North Carolina. "Accompanied" is defined as maintaining a proximity to the hunter which enables the adult to monitor the activities of, and communicate with, the hunter at all times.

Adult (age 12 or older) *(check appropriate block)*:

- ☐ Comprehensive Inland Fishing $250
  (N.C. residents only—includes basic inland fishing, trout & trout waters on game lands)
- ☐ Comprehensive Hunting $250
  (N.C. residents only—includes basic hunting, big game, game lands & N.C. waterfowl)
- ☐ Sportsman $500
  (N.C. residents only age 12 or older—includes basic hunting & inland fishing, big game, game lands, trout & N.C. waterfowl)
- ☐ Coastal Recreational Fishing $250
  (N.C. residents only—includes coastal recreational fishing)
- ☐ Unified Sportsman/Coastal Recreational Fishing $675
  (N.C. residents only—includes same privileges as the Sportsman, plus coastal recreational fishing)

A federal waterfowl stamp must be purchased separately for all N.C. hunting licenses.

Note: On or after July 1, 1991, a person, regardless of age, may not procure a hunting license or hunt in North Carolina without producing a certificate of competency for completing the hunter safety course or a hunting license effective prior to July 1, 1991, or by signing the statement below that he or she had such a license.

Check appropriate block and attach required copy:

- ☐ Copy of Prior Year Hunting License
- ☐ Copy of Hunter Safety Certificate of Competence
- ☐ In lieu of copy, I am signing the statement below:

Statement: I certify that I was a licensed hunter prior to July 1, 1991.

Signature _____ Date _____

Visit us online at www.ncwildlife.org or call 1-888-248-6834 for a complete list of lifetime licenses, including those for nonresidents and 65 and older.

Lifetime License

Complete the following information if applying for a lifetime license. Be sure to check appropriate block(s) on reverse side *(please print legibly)*:

Name of Applicant _____

Daytime Phone _____

Mailing Address _____

Resident Address _____

County _____ Date of Birth _____ Driver License # _____

E-mail Address _____

Is this license a gift? ☐ Yes ☐ No If yes, mail license to ☐ Donor or ☐ Applicant.

License Donor's Name *(if applicable)* _____

Donor's Telephone # _____

Donor's Mailing Address _____

City _____ State _____ Zip _____

Method of Payment: ☐ Check ☐ VISA ☐ MasterCard

Acct. # _____ Expires _____

Print name exactly as it appears on credit card _____

Cardholder's Signature _____ Date _____

Personalize your Lifetime License for an additional $5:
Indicate your selection of letters, numbers, dashes, periods, commas and /or blanks up to 6 spaces: ___ ___ ___ ___ ___ ___

Indicate your personal message including letters, numbers, dashes, periods, commas and /or blanks up to 21 spaces:

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Signature of Applicant or Donor _____ Date _____

Note: Only adult lifetime licenses may be purchased by phone or online (VISA or MasterCard only). Call toll-free (1-888-248-6834) or visit us at www.ncwildlife.org. Use this form to purchase infant and youth lifetime licenses by mail.

Tax-Deductible Contribution

☐ I wish to make a tax-deductible contribution to the Wildlife Endowment Fund. Enclosed is my check for $ _____. *(Credit card payments cannot be accepted.)*

Name _____

Daytime Phone _____

Mailing Address _____

City _____ State _____ Zip _____

Make checks payable to: *Wildlife Endowment Fund*

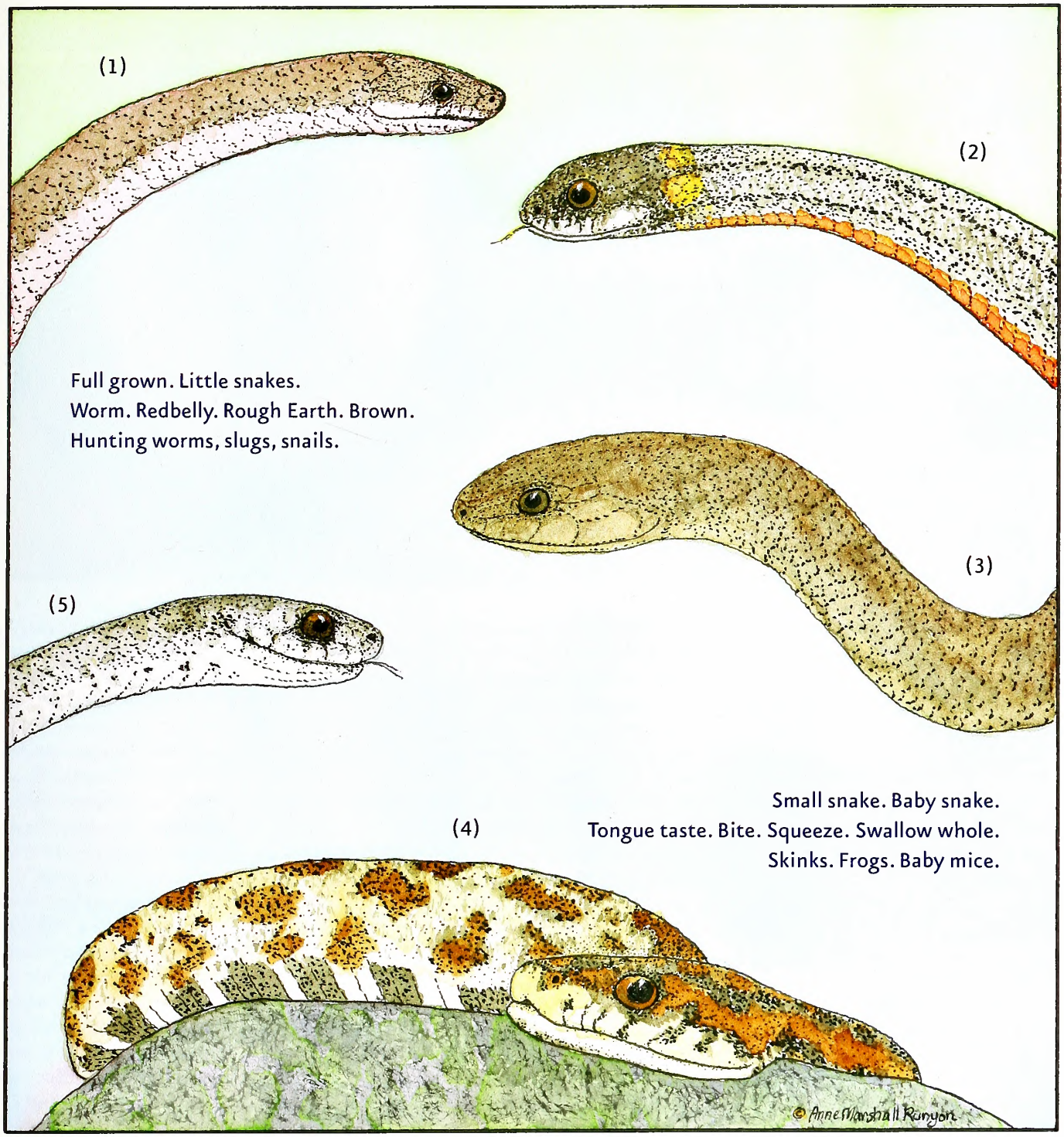
Transactions are not considered final until the check has cleared the bank. Items purchased with a returned check will be made invalid. A service charge of up to $25 will be charged on any returned check. (N.C.G.S. 25-3-506)

Mail completed application and payment to:
NCWRC, License Section, 1707 Mail Service Center, Raleigh, NC 27699-1707

Office location: *NCSU Centennial Campus, 1751 Varsity Drive, Raleigh, N.C. 27606*
Telephone: 1-888-248-6834 (2HUNTFISH)

Small Serpents

Which one is the baby snake?



1- Worm Snake adult length is 7.5" to 13". 2- Redbelly Snake adult length is 6.5" to 12". 3- Rough Earth Snake adult length is 7" to 12.5". 4- Corn Snake hatchling length is 12.5" and adult length is 30" to 70". 5- Brown Snake adult length is 9" to 18".

back porch

NEWS and NOTES

Edited by Mike Zlotnicki

White-nose Syndrome Decimates Bats

GARY PEEPLES/USFWS

NCWRC Biologist Gabrielle Graeter photographs one of two dead bats found in the mine. The bats will be sent to a lab at the University of Georgia to be tested for white-nose syndrome.

Biologists with the N.C. Wildlife Resources Commission and U.S. Fish and Wildlife Service have determined that white-nose syndrome (WNS) is continuing to decimate bat populations in western North Carolina, with some infected locations showing up to a 95 percent decline in hibernating bats over the past one to two years. The disease, which has been confirmed in seven counties in western North Carolina, does not affect people.

Wildlife Commission biologists surveying bat populations have documented declining bat populations by site. The number of bats hibernating in a retired mine in Avery County has plummeted from more than 1,000 bats prior to WNS to around 65 bats in just two years since the disease was discovered. At a mine in Haywood County, the number of bats hibernating dropped from nearly 4,000 bats to about 250 bats in only one year.

The fungus grows on bats in caves during torpor, the hibernation-like state bats enter during winter. Infected bats may spread the fungal spores to other bats and roosts during the warmer summer months. However, the fungus only grows in a narrow range of temperatures (41 to 56 degrees) in high humidity conditions. Although these conditions are prevalent in hibernation caves, bat houses are used during the summer months and have no more potential to spread fungal spores than do natural roosts, such as hollow trees.

White-nose syndrome continues to spread, affecting bats throughout the mountains. Bats in two additional counties—Rutherford and Buncombe—are now confirmed to have the disease, and the disease is suspected in Swain County. First detected in North Carolina in 2011, WNS was confirmed in an abandoned mine in Avery County, a cave at Grandfather Mountain State Park in Avery County, an abandoned mine in Yancey County, Linville Caverns in McDowell County and from a dead bat found in Transylvania County. In 2012, hibernating bats in Haywood County were confirmed positive for WNS.

Across North America, nine bat species are known to be affected by white-nose syndrome. North Carolina is home to 17 species of bats. While eight of those species have been discovered with the fungus elsewhere, the disease or the fungal spores have been documented on only four species here. Those species are the tri-colored, Northern long-eared, big brown and little brown bats.

In March 2010, the Wildlife Commission took necessary steps to get ahead of the disease by adopting the "White-nose Syndrome Surveillance and Response Plan for North Carolina" in concert with the U.S. Fish & Wildlife Service and many other partners. The plan outlines a number of steps to protect bats while allowing biologists to pinpoint and investigate a possible outbreak as quickly as possible. There is evidence that people may inadvertently spread the disease-causing fungus from cave to cave. Therefore, the most important precaution people can take to help bats is staying out of caves and mines.

Bats are important to ecosystems worldwide, including North Carolina. They have an enormous impact on controlling insect populations. A nursing female bat may consume almost her entire body weight in insects in one night, including insects that harm crops and forests. The U.S. Geological Service estimates that loss of bats in North America could lead to agricultural losses exceeding $3.7 billion annually.

e NEWSLETTER

Get N.C. Wildlife Update—news including season dates, bag limits, legislative updates and more—delivered to your Inbox from the N.C. Wildlife Resources Commission. Sign up at ncwildlife.org/enews.

A Well-Traveled Striper

JEREMY McCARGO/NCWRC

Wildlife Commissioner Mitch St. Clair, pictured, accompanied commission biologists Jeremy McCargo, Ben Ricks, and Kevin Dockendorf on a striped bass sampling trip last April on the Roanoke River in conjunction with the Division of Marine Fisheries (DMF). St. Clair is pictured with female striped bass No. 271, who had been tagged with an external anchor tag and an internal sonic transmitter for tracking. "It was very exciting," said St. Clair. "They did some hard work. This was the biggest fish I've ever been in contact with. I plan to go again."

In one year No. 271 grew a third of an inch (44.3 inches) but gained 5.5 pounds to 46.2. The sonic transmitter, monitored at different locations by the U.S. Navy, Stony Brook University, DMF and N.C. State, showed that she completed her downstream migration out of the river on May 6, 2012 and was detected at the Hwy 32 bridge in Albemarle Sound the same day. On June 6 she was detected off the coast of New Jersey near Asbury Park.

Later in June she was swimming off of Long Island and hung around until mid-October. She spent New Year's Day near Virginia Beach and was detected back in N.C. waters near Pirate's Cove in early April and was back in Weldon on April 15. This telemetry project was funded by Coastal Recreational Fishing License proceeds.

State Record Crappie and Drum

After more than a year without a new freshwater fish state record, the N.C. Wildlife Resources Commission recently certified two new record breakers—a freshwater drum from Kerr Reservoir and a white crappie from a private lake in Wake County.

On March 20, Jonathan Wilkerson of Oxford landed a 23-pound, 8-ounce freshwater drum while fishing on Kerr Reservoir, in an area known as Beaver Pond Creek. He caught the new state record using a plastic fluke on 10-pound test line.

Twelve days later, on April 1, Joey Boretti, of Holly Springs, was fishing a private lake in Wake County when he reeled in a 3-pound, 15-ounce white crappie, using a Storm WildEye® Swim Shad lure on a spinning rod.

Both anglers were fishing in the early evening—a particularly good time to catch white crappies, which are most active at sunrise and sunset. Boretti, an experienced angler although he's only 17, says he crappie fishes often and finds that they bite best around 6 or 7 p.m.

To qualify for a N.C. Freshwater Fish State Record, anglers must have caught the fish by rod and reel or cane pole, have the fish weighed on a scale certified by the N.C. Department of Agriculture, witnessed by one observer, have the fish identified by a fisheries biologist from the Wildlife Commission, and submit an application with a full, side-view photo of the fish.

Visit the commission's website, ncwildlife.org, for a list of all freshwater fish state records in North Carolina or for more information on the State Record Fish Program.

IN SEASON

In July and August, these seasons are open in North Carolina:

Hatchery-Supported Trout Waters: Through February 28, 2014.

Crow: Through July 31, Wednesday, Friday and Saturday, plus Independence Day.

There is no closed season or bag limit for groundhog, coyote, striped skunk, nutria and armadillo. There is an open season for taking beaver with firearms or bow and arrow during any other open season for the taking of wild animals.

Check the *2012–2013 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest* for bag limits and applicable maps or visit ncwildlife.org.

Centennial Campus Center Programs

The Center for Wildlife Education on the Centennial Campus in Raleigh is offering workshops this summer. Most run from 8 a.m. to noon. Here's a list of events and audiences:

July 10	Outdoor Survival Nature Nuts (ages 5–7) (Full)
July 11	Outdoor Survival EcoExplorers (ages 8–10)
July 12	Outdoor Survival Junior Biologists (ages 11–15) (Full)
July 16	Archery Nature Nuts (ages 5–7)
July 17	Archery EcoExplorers (ages 8–10)
July 18	Archery Junior Biologists (ages 11–15)
July 19	Archery Adults (ages 16 & up)
July 30	Geocaching Families (max. 2 children per adult)
July 31	Geocaching EcoExplorers (ages 8–10)
August 1	Geocaching Junior Biologists (ages 11–15)
August 2	Geocaching Adults (16 & up)
August 13	Turtle Tracking Families
August 14	Turtle Tracking EcoExplorers (ages 8–10)
August 15	Turtle Tracking Junior Biologists (ages 11–15)
August 16	Turtle Tracking Adults (16 & up)

For more information go to ncwildlife.org/Learning/CoursesSeminarsWorkshops.aspx or call 919-707-0209.

CALENDAR OF EVENTS

Saturday, July 6

Head west and celebrate the 'coon dogs at the 50th Annual Coon Dog Day in Saluda. There will be live music, a 5K run, a parade and more than a few 'coon hounds. Visit saluda.com.

July (Many Dates)

With the opening of dove season just two months away, it's time to get those new hunters-to-be enrolled in a Hunter Education Program course. More than a firearm safety course, instruction includes ethics and responsibility, conservation and wildlife management, wildlife identification, survival and first aid, specialty hunting and tree stand safety. This 10-hour minimum course is required for all first-time hunting license purchasers. These free classes often fill up so go to ncwildlife.org/Hunting/LearnResources/HunterEducationCourses.aspx to register.

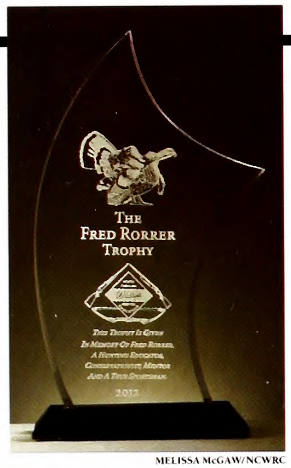
Saturday–Sunday, August 3–4

Celebrate the Second Amendment and buy a new or used firearm at the Dixie Gun & Knife Show. It happens at the Jim Graham Building at the N.C. State Fairgrounds. Guns, ammo, knives, collectables and other gear will be available. Go to dixiegunandknifeshow.com/pages/Raleigh-Show.html for a discount coupon and more information.

Friday–Sunday, August 16–18

"North Carolina's Largest Inventory Clearance Sale," the Carolina Fall Boat Show & Sale returns to the N.C. State Fairgrounds Jim Graham Building. Thousands of dollars off SRP is available on 2012 & 2013 units displayed and "deep discounts" are available on pre-season 2014 units. Visit ncboatshows.com.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to mike.zlotnicki@ncwildlife.org, or call 919-707-0175.



MELISSA McGAW/NCWRC

Youth Hunter Education Skills Winners

Teams from Gray Stone Day School and Park Ridge Christian School were big winners at the 2013 Youth Hunter Education Skills Tournament, the pre-collegiate shooting sports state championship, held April 27 by the N.C. Wildlife Resources Commission at Millstone 4-H Center in Richmond County.

Youths competed in team and individual categories for rifle, shotgun, archery and compass on senior (high school) and junior (middle and elementary schools) divisional levels, with overall team and individual awards based on aggregate scores in all events.

The Gray Stone "Garnet" team won the senior division with an overall score of 3,839 out of a possible 4,000, while Park Ridge won the junior division with an overall score of 3,635. Both schools are in Stanly County.

There were 575 students from 55 schools participating in this year's tournament, having advanced from nine district events across the state where there was combined participation by more than 2,700 students from 271 schools.

"The competitors are a great reflection of hunting, conservation and the outdoor recreational community. These kids are exemplary in their skills and commitment," said Travis Casper, the state hunting education coordinator and tournament director. "The competition is based on demonstrating the basic elements of hunter education, the same things that are taught in courses offered free by the Wildlife Commission to the general public throughout the year."

The Fred Rorrer Trophy, which recognizes sportsmanship among competitors, was presented to Piedmont High School, of Monroe, in Union County. The trophy honors its namesake, a longtime hunting education instructor with the Wildlife Commission who died unexpectedly in October 2010.

Overall attendance, including spectators, staff and competitors at the tournament, was estimated to be nearly 3,200.

Cross Point Gets A Makeover

When Conservation Technician Patrick Yarboro and his crew began work on the Cross Point Boating Access Area last January, they started with two boat ramps and a dusty gravel parking lot. What they finished with is four new ramps with two 80-foot floating docks. The site also features a floating courtesy dock and floating fishing pier. The newly paved and lighted parking lot, which was contracted to a local company, includes 17 parking spaces for single vehicles and 124 spaces for vehicles with trailers. The entire site is now fully accessible and meets the guidelines of the Americans with Disabilities Act. The new site opened May 3, and angler Jeffery Thomas was present.

CAROLYN RICKARD/NCWRC

CAROLYN RICKARD/NCWRC

Thomas, a bass guide and tournament angler, has fished the lake since 1983 and welcomed the renovation.

"It was a dust bowl, basically," he said of the old facility. "It's a vast improvement. The courtesy docks will help with launching and loading. The new public fishing dock will keep people out of the way of boaters."

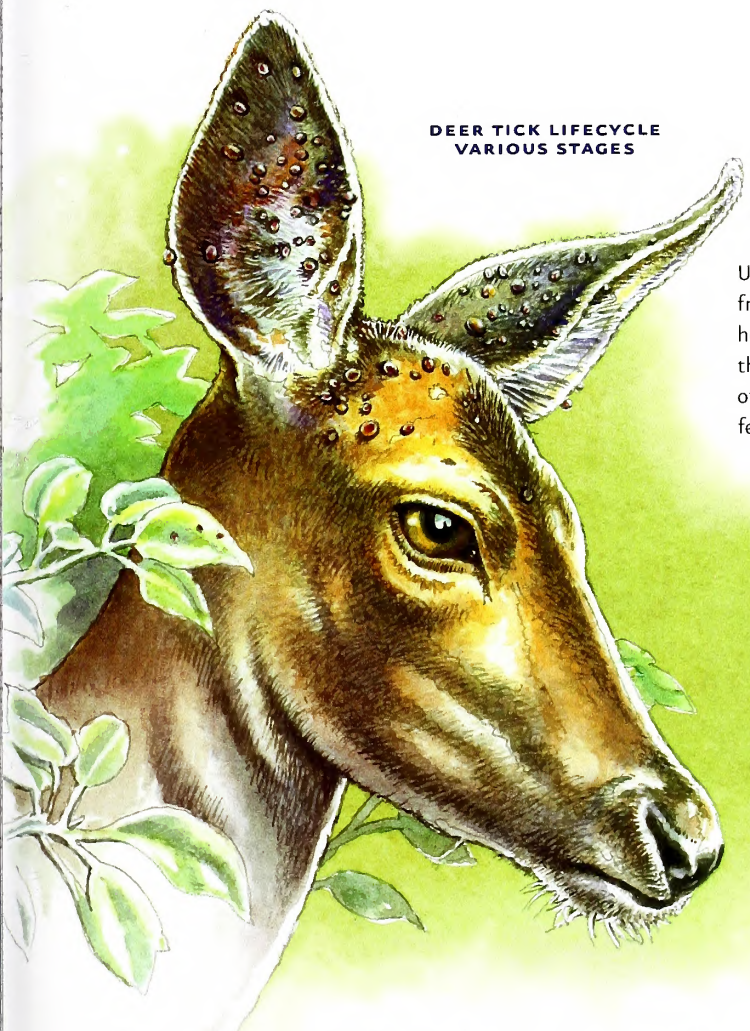
Thomas said there had been a "buzz" in the fishing community about the renovations, which were done on schedule and under budget and paid for by license fees and vessel registrations.

"This is one of the best bass lakes in the nation," he said. "Now, the quality of the facilities matches the quality of the lake."

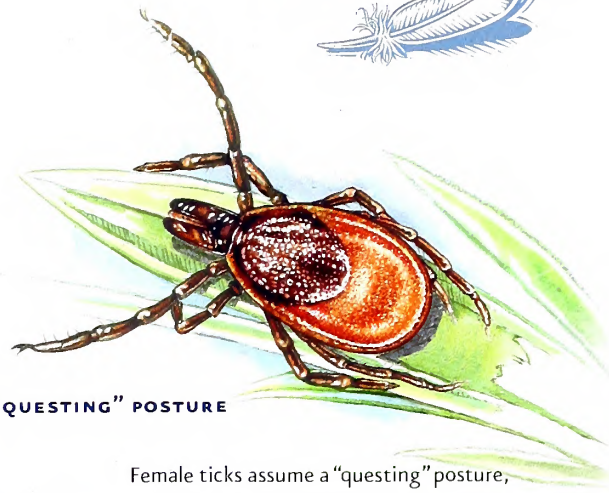
Why Do Deer Ticks Stay Attached So Long?

written by Clyde Sorenson
illustrated by Jim Brown

THE BLACK-LEGGED DEER TICK IS NOTORIOUS as the primary vector of Lyme disease. Deer ticks pick up their loads of pathogens as larvae and nymphs, but transmit the disease to humans primarily as adults. In order to complete their life cycle, female deer ticks must take one large blood meal, which can take up to 10 days.

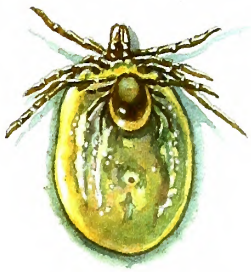


DEER TICK LIFECYCLE VARIOUS STAGES



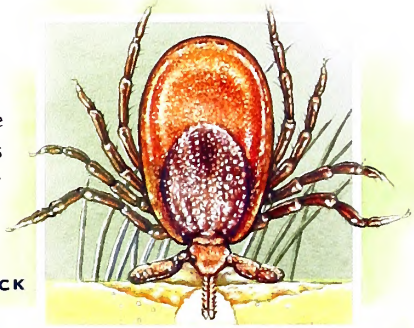
"QUESTING" POSTURE

Female ticks assume a "questing" posture, with the forelegs outstretched, on vegetation where potential hosts are likely to pass. When they sense the heat, CO_2, and odors of a passing host, they grab on and seek an attachment site where they aren't likely to be groomed off.

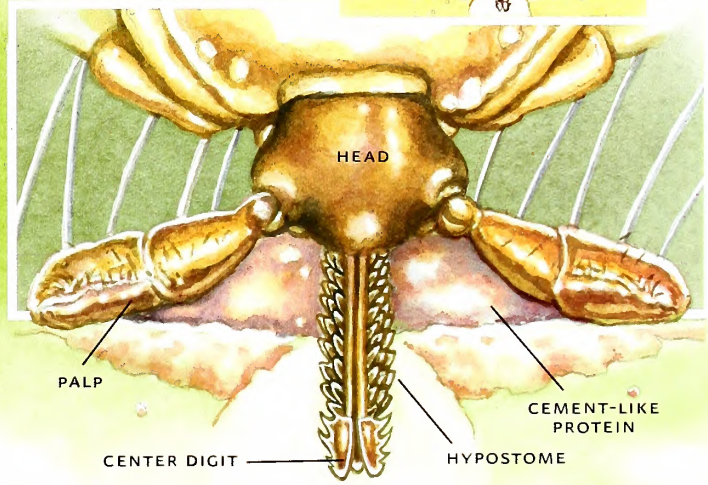


MATING DEER TICKS

Unlike most other "hard" ticks, deer ticks frequently mate before they attach to a host; female deer ticks can do this because they can store sperm for prolonged periods of time. Males may board hosts looking for females, but rarely feed.



ATTACHED DEER TICK



The tick remains attached for so long for two primary reasons. First, it is going ingest 100 times its unfed weight in blood. Second, in order to accomplish this, it actually has to grow new cuticle to accommodate the vast meal. Adult females feed only once; they lay one massive egg mass after their blood meal and then die.

CUTICLE GROWTH

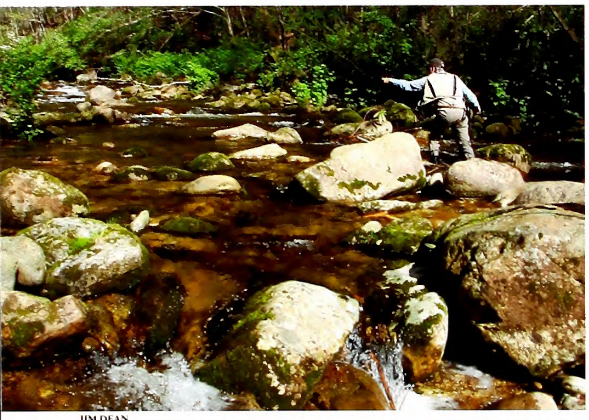
The female inserts her barbed mouthparts into the host and "glues" itself in with a cement-like protein. It injects anticoagulants to keep the blood flowing- and potentially injects Lyme spirochetes at the same time. It takes several hours to completely attach.

Trout Daddies

written by Jim Dean

Ever hear of Harry Cornell? Chances are his name is unfamiliar to most trout fishermen in North Carolina, but we owe him—and others also largely forgotten—a huge debt for the good fishing we enjoy today.

The quality of North Carolina's trout fishery is partly a result of fortuitous geography. With the highest mountains east of the Mississippi and approximately 4,000 miles of trout streams—many of them remote and relatively inaccessible—we are blessed with more prime trout water than any other state in the Southern Appalachians.



JIM DEAN

Yet, much of it could easily have been degraded, and possibly lost forever. Trout fisheries here and across the country faced many serious environmental threats during the decades of the 1960s and 70's. This was also a period that saw significant advances in cold-water fish management that went far beyond the stocking of hatchery trout. Few people, however, seem to remember that in 1960 North Carolina led the nation in adopting trout regulations that were so innovative and bold that they became the model for wild trout management throughout the country, changing not only the way we manage trout and fish, but influencing the core ethics of the sport.

"The quality of North Carolina's trout fishery is partly a result of fortuitous geography"

Harry Cornell was chief of what was then the N.C. Wildlife Commission's Division of Inland Fisheries. Working with Bud Ratledge and the rest of his fine cadre of biologists, Harry proposed establishing what he called "native" and "trophy" regulations on 24 quality streams. The 20 "native" streams would have a daily bag limit of four fish, a minimum size limit of 10 inches, a single-hook restriction, and be open only three days a week. The four "trophy" streams would have a daily limit of one trout 16 inches or over and a single-hook restriction, but be open seven days a week. One of the "trophy" streams—Lost Cove—was further restricted to flies only.

Log fish barriers were constructed on the lower ends of some of these streams to slow intrusion of undesirable species, and were also poisoned and restocked with wild strains of trout. When the "native" and "trophy" regulations went into effect in 1960, only one other stream in the nation had such stringent restrictions—a short stretch of flies-only water at Fly Fisherman's Paradise on Spring Creek in Pennsylvania. No state had anything to match that 24-stream package.

Although the original native and trophy concept was eventually replaced years later with weakened regulations, that setback was short-lived and soon replaced with the biologically sound wild trout focus that continues today and includes pure catch-and-release waters.

Those early years also saw significant strides made to deal with other threats to our streams. Silt was a major problem in most states, especially from highway renovation and construction. Here in North Carolina, a project in the mid-1970s to improve a winding portion of Highway 181 between Morganton and Pineola created a classic confrontation. The stretch to be re-routed ran up the steep ridge between Upper and Steeles creeks—two outstanding "native" waters. Wildlife Commission fisheries biologist Bob Brown and his assistant, Joe Mickey, dogged the site daily, badgering the highway crews to add silt fences and log settlement basins. They were so persistent that the workers nicknamed them "Batman" and "Robin," but they eventually got the cooperation they wanted, saving both creeks with minimal damage. Indeed, the spreading controversy prompted the state to begin, for the first time, to include the costs of silt control in the cost-benefit analysis and environmental impact assessments of every road project undertaken in the state.

Major logging operations were also big threats to trout streams at this time, but that began to change under pressure from anglers and environmentalists as the U.S. Forest Service adopted new guidelines that restricted the size and placement of clear-cuts, established no-logging areas, and left buffer zones near creeks.

There isn't space to credit all the groups and individuals who have played a part in preserving and enhancing out trout resources. Trout Unlimited, for example, has grown to be an active watchdog of our trout heritage, but it formed its first North Carolina chapter in 1960 with just eight members—too late to lend much more than vocal support to Harry's original dream. Certainly it is fitting to applaud commission fisheries biologist, Bill Bonner, who added another coup to the state's list of achievements when he became the first to identify the native Southern Appalachian brook trout as a distinctly different strain, unique in the world, and worthy of greater protection.

When you catch a wild trout, give a salute to those who helped make that possible. You might also like to know that Harry left another legacy, bequeathing his beloved Bass Lake in Wake County to The Nature Conservancy where it is now a park administered by Holly Springs.

TODD PUSSER

Katydid

OUTDOOR MOMENT

IN THE SEPTEMBER • OCTOBER ISSUE

MELISSA McGAW/NCWRC

DO-IT-ALL DOGS
Take a look at versatile hunting dogs, those equally at home in both marshes and upland fields.

THE BROWN BASS
In the waters of the western Piedmont and Mountains, the smallmouth bass is among the gamest of game fish.

MORE THAN A BRAND
Memories more than money determine a hunter's choice of the shotgun that accompanies him through the years.

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